

# Hanford Healthy Energy Workers - Healthcare Needs Assessment and Recommendations



Pursuant to Engrossed Substitute Senate Bill 6168 Sec. 127(83),  
Chapter 415, Laws of 2020

**RESEARCH SERVICES**

June 1, 2021

REPORT TO THE LEGISLATURE

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# Acknowledgments

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# Table of Contents

<b>Executive Summary .....</b>	<b>2</b>
<b>Introduction.....</b>	<b>5</b>
<b>Findings .....</b>	<b>9</b>
<b>Recommendations Framework.....</b>	<b>17</b>
<b>Hanford Healthy Energy Workers Center .....</b>	<b>18</b>
<b>Improve Access to Primary Care, Acute Specialty Care and Chronic Disease Management.....</b>	<b>22</b>
<b>Improve Healthcare Quality and Coordination of Services.....</b>	<b>24</b>
<b>Conclusions.....</b>	<b>27</b>
<b>Appendix A: Assessments of Hanford Worker Protection and Key Indicators of Progress.....</b>	<b>29</b>
<b>Appendix B: Medical Surveillance Systems Inventory .....</b>	<b>44</b>
<b>Appendix C: Glossary.....</b>	<b>49</b>
<b>Appendix D: Workforce Survey Results.....</b>	<b>53</b>

# Executive Summary

## Overview

The Hanford nuclear site is a sprawling, 560-square mile area in Southcentral Washington where, for more than four decades (1944-1987), the federal government produced plutonium for nuclear weapons and missile warheads.

During the years of plutonium production, many highly radioactive byproducts and waste chemicals were dumped directly into the ground or stored in subterranean multi-million-gallon underground storage areas known as tank farms. Unique hazards of radioactive materials exist, including from metals used in uranium rod cladding and processes (e.g., mercury; beryllium); building and protective materials (such as asbestos and silica); and toxic chemicals used for extraction of plutonium from the raw mixture of highly radioactive material that was the byproduct of controlled nuclear reactions.

### Cleanup Mission

In the late 1980s, the Department of Energy's mission at the Hanford site shifted from production to cleanup. In 1993, with the declassification and release of previously classified documents, the types and extent of contamination and potential exposure became apparent—especially from various chemical vapors and, uniquely, beryllium.

Today, about 8,000 Hanford employees are involved in the environmental cleanup project. Crews responsible for site cleanup continue to deal with several different kinds of waste in a number of different forms, with many of the wastes being potentially harmful to people and the environment. As reported by the Department of Energy (DOE) in 2019, the federal government plans to have a presence at the Hanford Site well beyond 2095.<sup>1</sup>

### Increasing Concern over Beryllium and Tank Farm Vapor exposures

During the past 20 years, concerns of the Hanford workforce have primarily been related to:

- Chemical vapor exposure at the tank farms
- Beryllium exposure at various sites where beryllium-containing tools were used or beryllium-containing products were used in ways that left behind beryllium dust or oxide

Due to the unique possible exposures at Hanford, potential health consequences can be atypical and difficult to diagnose and treat, requiring specialized medical services and training. Health effects experienced by Hanford workers are complex. They can present within minutes of exposure or over the course of several years. Active and former Hanford workforce members consider their health still at risk from their work and perceive that there is little that the healthcare system does or can do to remedy their disorders.<sup>2</sup>

### Hanford Healthy Energy Workers Board

To address requirements detailed in ESSB 6168 Sec.127(83) (2020), the Washington State Department of Commerce (Commerce) convened the Hanford Healthy Energy Workers Board (board). Board members represented a broad range of experience related to the unique work conducted at the Hanford site and the health needs for those who have worked there in the past or are currently working there today. The board met

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<sup>1</sup> U.S. Department of Energy, 2019 Hanford Lifecycle Report, [https://www.hanford.gov/files.cfm/2019\\_Hanford\\_Lifecycle\\_Report\\_w-Transmittal\\_Letter.pdf](https://www.hanford.gov/files.cfm/2019_Hanford_Lifecycle_Report_w-Transmittal_Letter.pdf)

<sup>2</sup> National Institute for Occupational Safety and Health Centers for Disease Control and Prevention U.S. Department of Health and Human Service, Review of Hanford Tank Farm Worker Safety and Health Programs November 28, 2016

over eight months to prepare this report: reviewing existing research, identifying unmet Hanford worker healthcare needs and developing recommendations for future efforts.

## Key Findings

- **Short-term and Long-term Exposure Continue to be of Concern among the Hanford Workforce:** The workforce survey inquired about workers' short-term and long-term exposure to hazardous materials. More than 57% of all current and former workers reported being in an exposure event. Over 32% of respondents indicated long-term exposure to hazardous materials.
- **Health Effects due to Short-term and Long-term Exposure Continue to be of Concern:** The workforce survey asked current and former workers about the health effects that they are experiencing due to their work at the Hanford site.
- **Gaps in Access to Healthcare Persist:** The workforce survey and healthcare provider interviews highlighted the complexity of managing long-term health effects for Hanford workers due in part to the often-delayed onset of exposure-associated health conditions.
- **Concern Expressed by Current and Former Workers:** Many narrative responses in the workforce survey expressed deep concerns about workers' compensation system processes and the healthcare system's ability to meet workers' needs.
- **Care Coordination is of Particular Importance for the Hanford Workforce:** This research identified deficiencies in continued engagement with workers after an initial assessment or diagnosis as a common obstacle for the Hanford workforce.
- **Emphasis on Workplace Hazards and Exposure Risks is Substantiated:** The number of responses received indicating exposures substantiates the Hanford Healthy Energy Worker Board's prioritized focus on these workplace hazards and exposure risks. Their responses confirmed that health effects are both acute and chronic in nature and warrant increased focus by the Legislature. A central finding is the vital role of care coordination from initial assessment and diagnosis to long-term follow-up care. In light of these findings, the Board makes the following recommendations:

## Recommendations

The following recommendations were developed for the Hanford Healthy Energy Workers Board over the course of an eight-month process for consideration by the Washington State Legislature and the Governor. Any next steps to make progress based on these recommendations will require action on behalf of the Washington State Legislature and the Governor.

### Create a Hanford Healthy Energy Workers Center

The board proposes that the state should support a new Hanford Healthy Energy Workers Center that can serve as a centralized clearinghouse for Hanford-specific health-related information that includes up-to-date scientific knowledge, research on emergent topics, exposure data analysis, medical surveillance data analysis and coordinated intergovernmental efforts for policy and advocacy.

### Improve Access to Primary Care, Acute Specialty Care and Chronic Disease Management

Steps should be taken to expand access to Hanford onsite healthcare services and primary and follow-up care in the greater Tri-Cities area. Measures range from creating a local, specialized clinic co-housed at the Hanford Healthy Energy Workers Center to exploring state regulatory and contractual mechanisms to increase access to medical specialties such as pulmonology and oncology.

## Improve Healthcare Quality and Coordination of Services

The board recommends improving the quality of care available to Hanford workers both at the Hanford site and in the Tri-Cities area. This research identified that patients sometimes did not receive a diagnosis until they visited and out-of-state or out-of-county clinic. Priorities for future consideration include improving coordination of care between providers, aligning incentives for high quality, coordinated healthcare, and convening the healthcare community to raise the overall standard of care that Hanford workers receive.

### Implementation Approach

- **Reconvene Hanford Healthy Energy Workers Board:** Since the Hanford Healthy Energy Workers Board does not continue in an official capacity beyond the preparation of this report to the Legislature, the Legislature and the Governor may wish to consider reconvening this group to steer the implementation of the recommendations in this report. Members of this board remain committed to positive outcomes for the Hanford workforce and could be a valuable resource to steer future efforts towards addressing the healthcare needs of the Hanford workforce.
- **Implementation Roadmap:** The Hanford Healthy Energy Workers Board recognizes that implementing the recommendations outlined in this study will be a multi-year effort. A productive next step or priority for the board will be to collaboratively develop an implementation plan with Legislative and Executive Branch partners.
- **Convene Working Groups:** The board also recognizes that to implement the recommendations outlined in this report, an interdisciplinary, multi-agency effort may be needed. A natural next step for the board is to begin convening working groups based upon the recommendations framework to 1) developing high-level scope and requirements to implement recommendations and 2) develop detailed stakeholder engagement plans.

# Introduction

## Background

In November 2019, the Healthy Energy Workers Working Group released its report to the Legislature initiated by SB 5627, An Act creating the healthy energy work group to develop the healthy energy workers board<sup>3</sup>. The report, facilitated by the University of Washington, made recommendations regarding the composition of a future Healthy Energy Workers Board and identified priorities for its initial work program.

Following this effort, the 2020 supplemental operating budget, ESSB 6168 Sec.127(83) (2020), built upon the priorities identified in the 2019 report and tasked Commerce with forming a Healthy Energy Workers Board to provide recommendations and a report to the Legislature. The Legislature appropriated \$250,000 for the state fiscal year 2021 to do this work. The proviso identified the following key activities for the healthy energy workers board:

- Conduct an unmet health care needs assessment for Hanford workers and develop recommendations on how these health care needs can be met.
- Review studies on how to prevent worker exposure, summarize existing results and recommendations, develop key indicators of progress in meeting unmet health care needs
- Catalog the health surveillance systems in use at the Hanford site.
- Submit a report to the Legislature by June 1, 2021, documenting recommendations on meeting health care needs, progress on meeting key indicators and, if necessary, recommendations for the establishment of new health surveillance systems at Hanford.

## Membership

Commerce built upon the recommendations in the 2019 report to the Legislature as it convened a new Hanford Healthy Energy Workers Board. Commerce extended invitations to previous members while reaching out to representatives from areas of expertise that were recommended for inclusion in the future board, including:

- A member with healthcare services evaluation expertise
- A member familiar with high-level healthcare services in the region
- A representative from the Hanford Worker Engagement Center (HWEC)
- A representative from the United States Department of Energy

Commerce extended invitations to board candidates representing all of these interests, with the Department of Energy declining to participate.

For the duration of the research covered in this report, the following individuals served on the Hanford Healthy Energy Workers Board:

Co-Chair - Marty Cohen, ScD, CIH, CSP, Assistant Chair for Stakeholder Engagement, University of Washington Department of Environmental and Occupational Health Sciences

Co-Chair - Nickolas Bumpaous, President, Central Washington Building Trades Council

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<sup>3</sup> Washington State Legislature, SB 5627, <https://app.leg.wa.gov/billsummary?BillNumber=5627&Year=2019>

Steve Maki, SMS, CHST

Mike Means, Director, Office of Radiation Protection, Washington State Department of Health

Esi Nkyekyer, Acting Assistant Professor, Medical Director OEM Clinic, Harborview Medical Center

Nicholas Reul, MD, MPH, Medical Officer for Occupational Safety and Health, Washington State Department of Labor and Industries

Mark Riker, Executive Secretary, Washington State Building and Construction Trades Council

Jason Sprowl, Workforce Specialist

Randi Walli, Business Manager, UA Local 598 Plumbers and Steamfitters

Dianne Whitten, Recording Secretary, Hanford Atomic Metal Trades Council (HAMTC)

Jill Wood, Director of the Office of Radiation Protection, Environmental Public Health Division, Washington State Department of Health

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Mike Means, Director, Office of Radiation Protection, Washington State Department of Health

Earl Fordham, Certified Health Physicist, Deputy Director of Office of Radiation Protection, Environmental Public Health Division, Washington State Department of Health

### **Role of Board Members**

Board members contributing to this report served based on their particular subject-matter expertise and did not necessarily represent any particular organization or agency's view or position. Members from executive branch agencies (Washington State Labor and Industries and Washington State Department of Health) provided guidance and consultation as subject-matter experts on the board with the knowledge that any recommendations for future action with policy or fiscal implications for state agencies were not necessarily the position of these agencies. Any recommendations with future policy or fiscal implications will be subject to a future legislative process and the OFM budget review process.

### **Guiding Principles**

The board developed and adopted the following guiding principles to help provide clarity and guidance throughout the project.

- Design survey and develop recommendations with objectivity and independence from prior studies, remaining open to emerging innovations.
- Be transparent with methods, results and findings.
- Show empathy towards challenges and barriers experienced by Hanford workers.
- Build broad stakeholder partnerships through iterative development.
- Protect the privacy of Hanford workers.
- Adhere to the mandate of the Legislative proviso.
- Deliver a substantive product to the Legislature that draws upon a wide range of resources (training, scientific, medical and community resources) that may be available; directly address the question of how to make currently not present resources available.
- Develop recommendations to enable address community need.



# Hanford Healthy Energy Workers Board Process

The board met regularly from August 2020 through March 2021. Meetings were held virtually under the Governor's emergency orders related to the COVID-19 pandemic and were subject to the Washington Open Public Meetings Act (OPMA). Meetings were open to the public through both internet and call-in options. Updates on the board's work were regularly posted to the [project website](#).

To assist in conducting the unmet healthcare needs assessment and to conduct the necessary research to prepare the report to the legislature, the board secured Avvento Consulting's services. Avvento Consulting brought expertise in survey design and implementation, occupational health, and specific experience in the unique issues for workers at the Hanford worksite

## Healthcare Needs Assessment

The Healthcare Needs Assessment consisted of two parts: 1) a Hanford workforce Survey and 2) interviews conducted with the healthcare provider community.

### Hanford Workforce Survey

The workforce survey was conducted online from January 4, 2021, through January 17, 2021. It garnered voluntary responses from 1,661 current and former Hanford workers recruited through various local advertising and media campaigns. Contacting the current and former workforce was a significant challenge; both due to disaggregate nature of the workforce split between various contracting companies and U.S. Department of Energy staff, as well as the fact that the U.S. Department of Energy chose not to participate in this process. A process with U.S. Department of Energy engaged directly in the process would potentially be able to establish participation of the current and former Hanford workforce more completely.

Survey participants were prompted to answer questions in the following areas, depending on whether respondents indicated that they had been in a radiological/chemical/particulate exposure event or whether they had experienced long-term exposure to hazardous materials:

- **Workplace Protection:** Respondents were surveyed as to whether they thought that workplace protective measures were sufficient.
- **Short-term Exposure:** Respondents who indicated that they had been in a radiological/chemical/particulate exposure event were asked additional questions about the timeliness of healthcare after an exposure event, the medical evaluation process, their confidence that the evaluation would be thorough and definitive and whether additional medical attention was needed.
- **Long-term Exposure:** Respondents who indicated that they had long-term exposure to hazardous materials were asked if they required additional medical attention.
- **Health Effects:** Survey respondents were asked if they had experienced health effects due to a short-term event or health effects due to long-term exposure.
- **Health Care Access:** Respondents were asked a series of questions about the access and affordability of health care. Questions included inquiries about access to transportation, the ability to pay for healthcare and access to additional onsite healthcare services.
- **Health Care Quality:** Respondents were asked about their assessment of the onsite medical staff (occupational medical contractor) and the ability of health care professionals in the Tri-Cities to address Hanford workers' unique healthcare needs.
- **Demographics:** - The survey gathered demographic data such as race/ethnicity, gender and age.

## Healthcare Provider Interviews

Healthcare provider interviews were conducted to augment the workforce survey on healthcare needs from the perspective of local clinicians and those outside the region familiar with Hanford workers' health needs. Nine individuals were interviewed, including primary care providers and specialists in hematology, oncology, pulmonology and allergy. Interviews focused on the providers' experience in serving Hanford workers, barriers to the treatment they encountered and recommendations to improve healthcare and Hanford workers' experiences.

## Review of Studies on How to Prevent Worker Exposure and Key Indicators of Progress

The project team reviewed known studies on how to prevent worker exposure and health effects. Specifically, the team reviewed studies and organized findings in the following manner:

- **Relevant Assessments:** For the Chronic Beryllium Disease Prevention Program (CBDPP), tank farm vapors and health effects studies, the team reviewed and provided citations to literature most relevant to worker protection and health effects. All of the works cited are publicly available or made publicly available by DOE.
- **Aggregated Findings/Recommendations/Corrective Actions:** Upon analysis of relevant findings, the team summarized findings, recommendations and corrective actions related to CBDPP and tank farm vapors. Each finding, recommendation and corrective action is categorized according to the type of actions that were recommended or agreed to by parties.
- **Key Indicators of Progress:** The board and project team then reviewed these recommendations and corrective actions as identified in the assessments for CBDPP and Tank Farm Vapors for any measurable or identifiable indicators of progress.

The results of this effort are included in Appendix A: Assessments of Hanford Worker Protection and Key Indicators of Progress.

## Catalog of the Health Surveillance Systems

The board sought to develop an inventory of existing medical surveillance and worker protection programs to reduce and monitor exposure risks. Specifically, the board and project team organized information gathered in the following manner:

- **Current Hanford Medical Surveillance Components:** Includes components of medical monitoring and diagnostics, and potential current worker eligibility, based on known hazards to be present at the Hanford site.
- **Additional Consideration:** In addition to programs targeted toward current Hanford workers, the board and project team have included additional medical surveillance programs available to former workers.

DOE has provided the updated medical surveillance programs employed by the onsite occupational medical provider, HPM Corporation Occupational Medical Services (HPMC OMS) as of March 17, 2021 for inclusion in this report. The results of this effort are included in Appendix B: Medical Surveillance Systems Inventory.

# Findings

To learn more about the healthcare experience of the greater Hanford worker community, a survey was conducted of more than 1600 past or current Hanford workers. Without direct access to past or current Hanford workforce contact information, participation was recruited on a voluntary basis using a variety of targeted outreach methods throughout the community. Respondents were nearly 70% male, more than 83% Caucasian or white and split nearly evenly between those older than 65 and those younger. For complete survey detail, review responses for each survey question in Appendix D.

## Survey Design

**Target Population** - Current and former Hanford workers were invited to a publicly available website (Hanfordsurvey.com) and then were directed to an online survey. At the outset of the survey, respondents were asked to indicate whether they were a current Department of Energy (DOE) employee, a current contractor employee, a former DOE employee or a former contractor employee. If a respondent indicated that they had never worked at Hanford, no further survey responses were collected from that individual.

**Survey Limitations** - One constraint of the survey is that the true statistical significance of results could not be determined because the total number of current and former members of the total Hanford workforce is unknown. Additionally, the project team relied on convenience or opportunity sampling as a method for finding respondents. Respondents were motivated to participate through word-of-mouth or in response to various advertising methods and do not represent a true random sample of the current and former Hanford workforce.

**Areas of Inquiry** - As directed by the board, the survey focused on key areas of inquiry to answer key questions about the unique healthcare needs of Hanford workers. Depending on whether respondents indicated that they had been in a radiological/chemical/particulate exposure event or whether they had experienced long-term exposure to hazardous materials, survey participants were prompted to answer questions in the following areas:

- **Workplace protection** - Respondents were surveyed as to whether they thought that workplace protective measures were sufficient.
- **Short-term exposure** - Respondents, depending on whether they indicated that they had been in a radiological/chemical/particulate exposure event, were asked additional questions about the timelines of healthcare after an exposure event, the medical evaluation process, their confidence that the evaluation would be thorough and definitive and whether additional medical attention was needed.
- **Long-term exposure** - Respondents, depending on whether they had indicated that they had long-term exposure to hazardous materials, were asked if they required additional medical attention.
- **Health effects** - Survey respondents were asked if they had experienced health effects due to a short-term event or health effects due to long-term exposure.
- **Healthcare access** - Respondents were asked a series of questions about the access and affordability of health care. Questions included inquiries as to access to transportation, the ability to pay for healthcare and access to additional onsite healthcare services.
- **Healthcare quality** - Respondents were asked about their assessment of the onsite medical staff (Occupational Medical Contractor) and the Tri-Cities area health care professionals' ability to address the unique healthcare needs of Hanford workers.
- **Demographics** - The survey gathered demographic data such as race/ethnicity, gender and age.

**Data Gathering Tools** - The survey was designed and approved by the board and was conducted using a commercially available online survey platform. Key tool features included data encryption and mobile device web browser compatibility.

**Privacy Safeguards** - To safeguard the privacy of Hanford workers responding to the survey, the respondents remained anonymous and no Personally Identifying Information (PII) or Protected Health Information (PHI) was gathered. Due to the anonymous nature of the survey, the board also consented to the recommendation that an Institutional Review Board (IRB) was not required to study human subjects. With several questions in the survey that permitted open-ended responses, there was a potential for respondents to include personally identifiable information. A disclaimer at the beginning of the survey, as well as where there are questions that have the potential for open-ended response was included.

## Survey Communications and Outreach

The board did not have direct access to DOE employee or contractor email distribution, so the following were the primary avenues utilized for outreach:

**Labor Organizations** - Outreach was conducted via union newsletter and email distribution lists to the labor organizations represented by board members

- Targeted communications materials for general distribution

**Print/Local Media** - Due to the large population of Hanford workers in the Tri-Cities area, Commerce engaged with local print and radio media outlets to advertise and promote the Hanford workforce survey.

- Tri-Cities Herald - print and digital advertising
- KONA Radio - up to six daily radio advertisements with additional coverage in interviews for news segments.

**Social Media** - Due to the online nature of the workforce survey, a natural outreach medium was social media advertisements targeting the Tri-Cities area. Because of the two-week timeframe survey timeframe and reduced in-person communications venues, this was an effective approach.

The following section describes the summary-level findings that were the impetus for developing recommendations. More detailed information about each survey question can be found in Appendix D.

- **Short-term and Long-term Exposure Continue to be of Concern among the Hanford Workforce.** The workforce survey inquired about workers' short-term and long-term exposure to hazardous materials. The number of responses received indicating exposures substantiates the Hanford Healthy Energy Worker Board's continued focus on these workplace hazards and exposure risks. Figure 1 shows that at least 57% of all current and former workers experienced acute exposure events, while Figure 2 demonstrates that at least 32% of respondents reported long-term exposure to hazardous materials. Workers who responded 'not sure/do not know' could potentially have had either acute or chronic exposures.

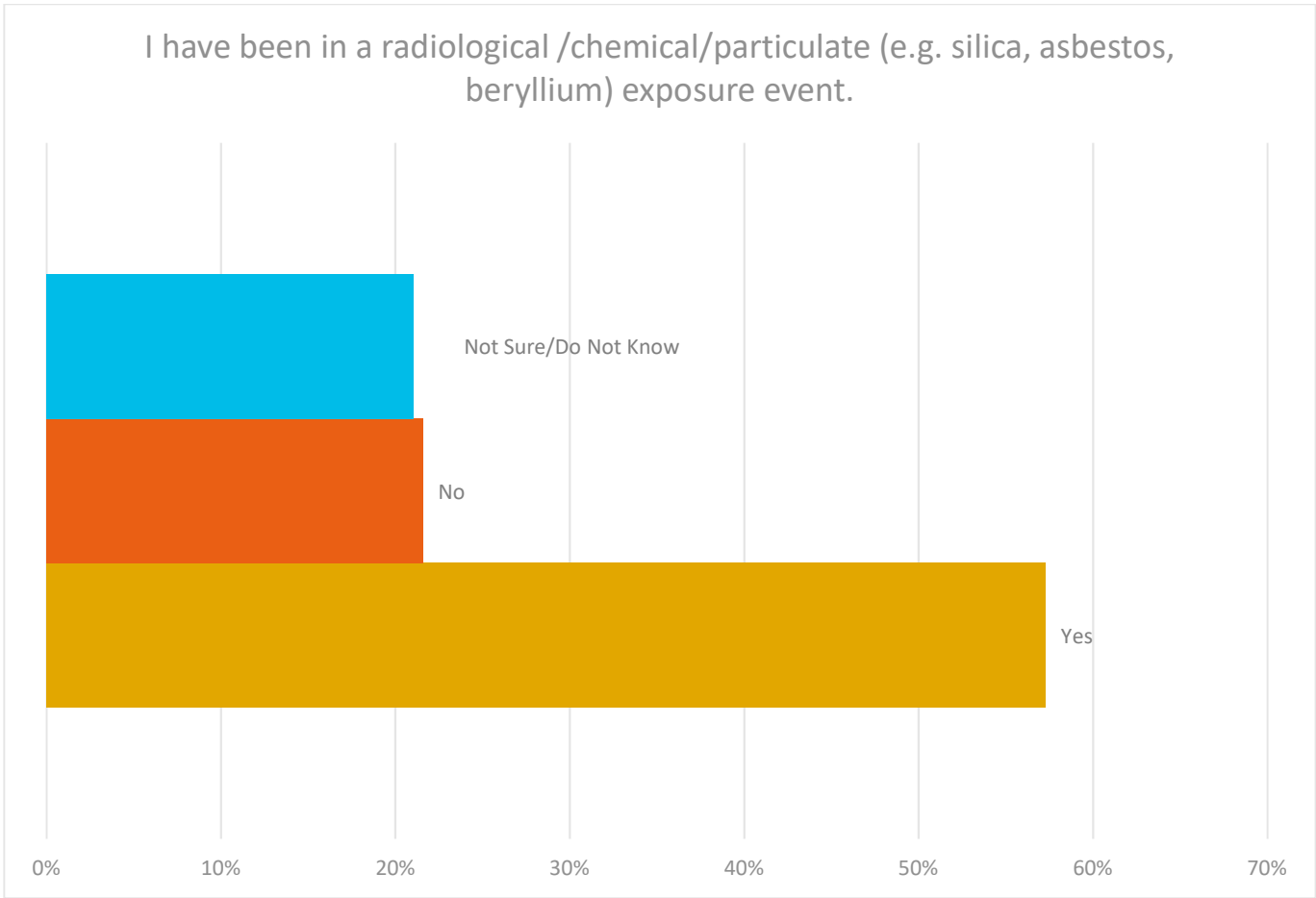


Figure 1: Workforce Survey - Acute Hazard Exposure

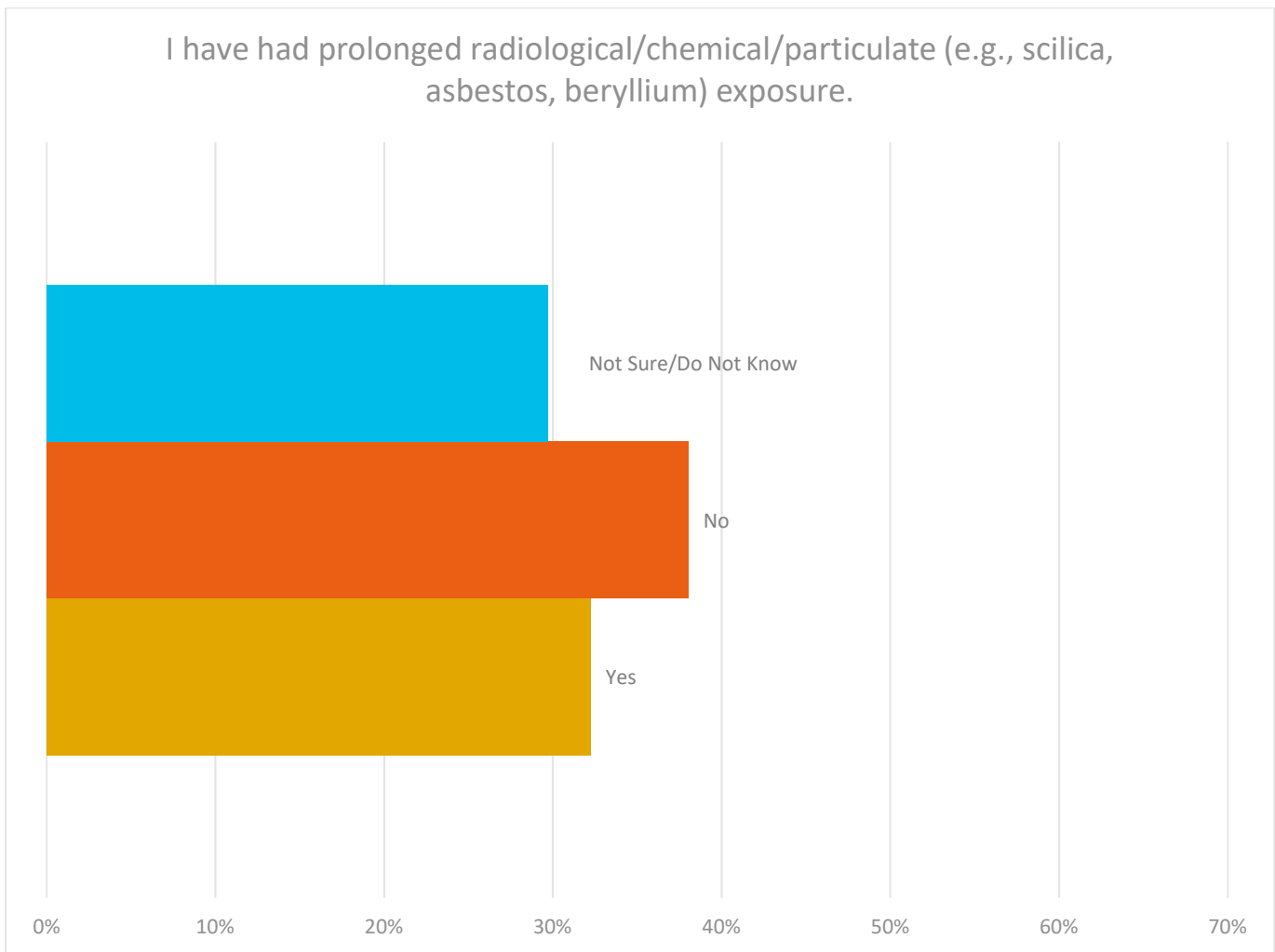


Figure 2: Workforce Survey - Prolonged Hazard Exposure

- **Health Effects due to Short-term and Long-term Exposure Continue to be of Concern.** The workforce survey inquired about the health effects that current and former workers are experiencing due to their work at the Hanford site. The survey responses received confirm that health effects are both acute and chronic in nature (Figures 3, 4) and warrant increased focus by the Legislature.

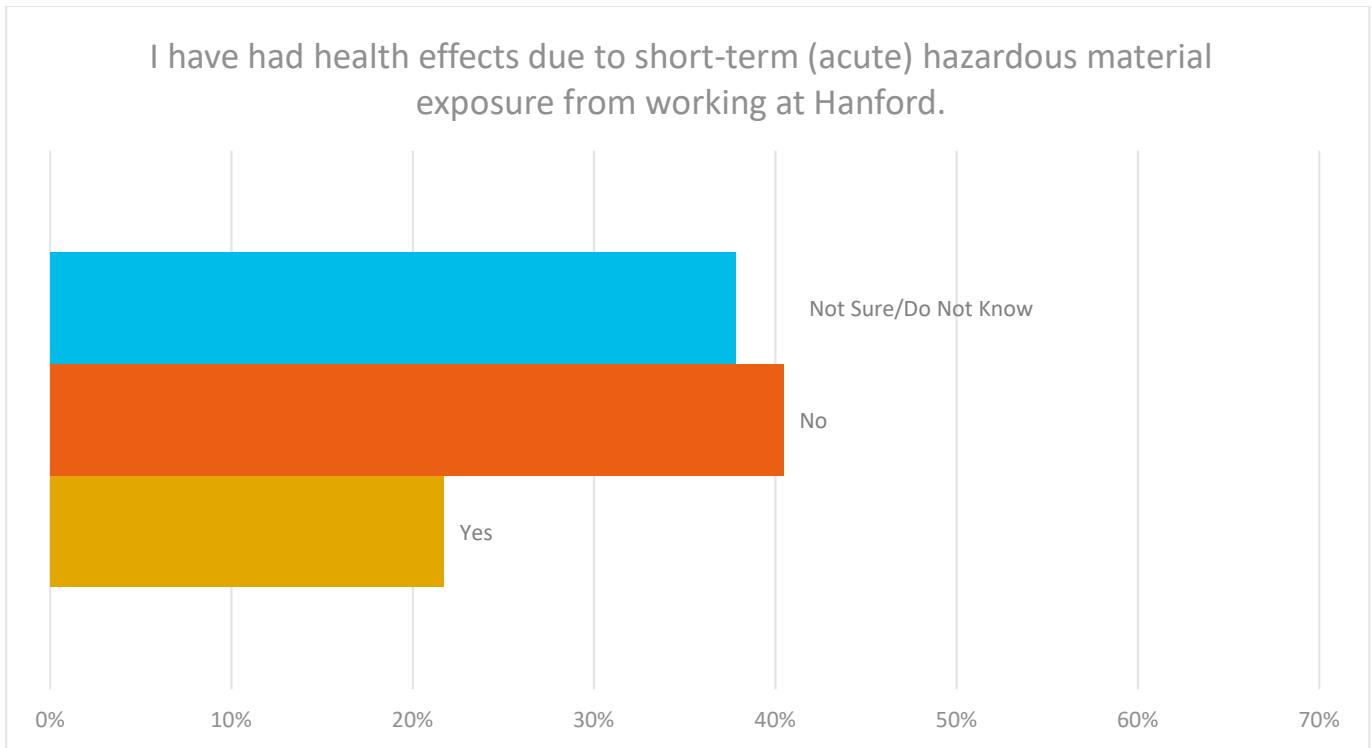


Figure 3: Workforce Survey - Health Effects, Acute Hazard Exposure

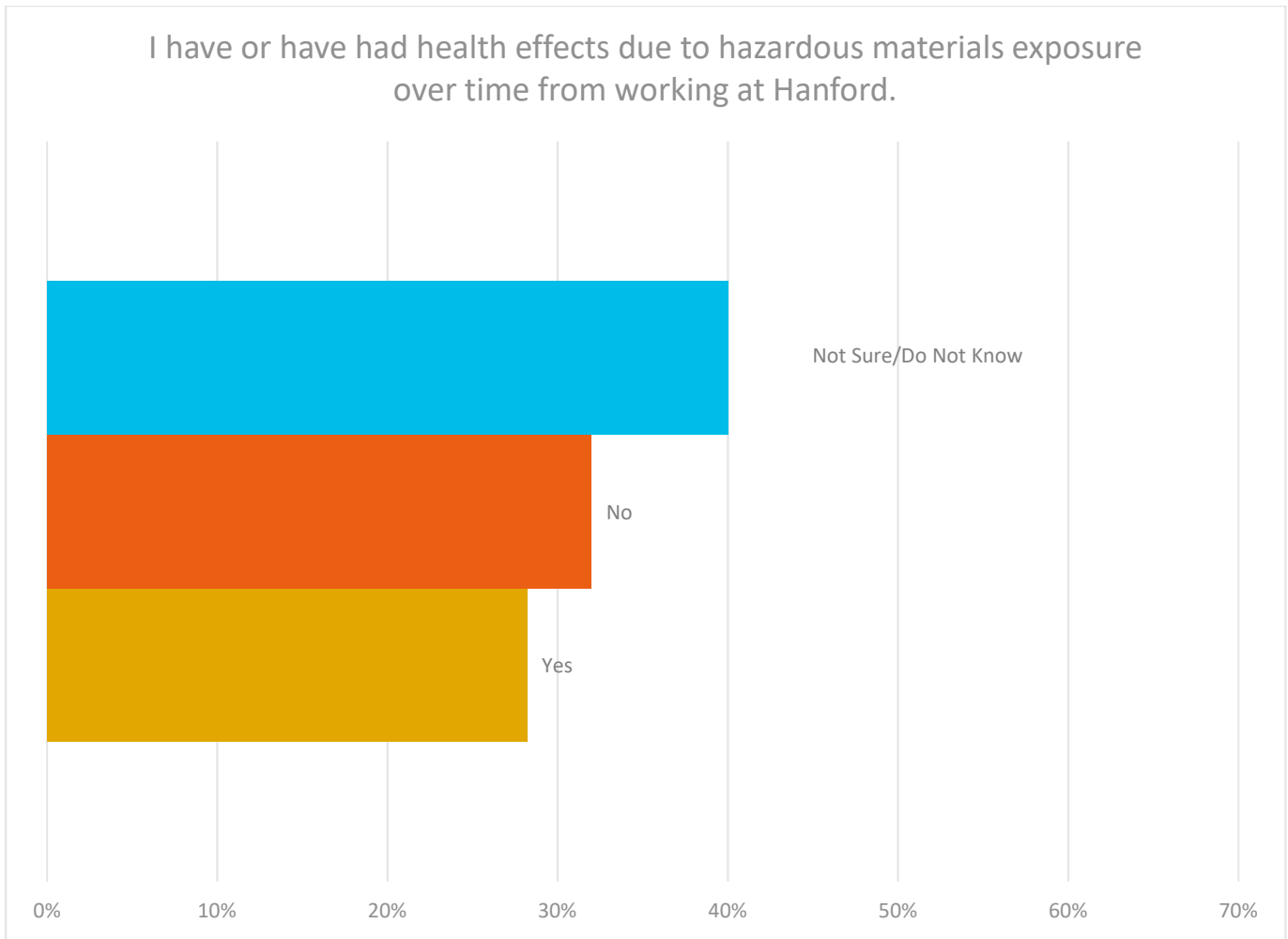


Figure 4: Workforce Survey - Health Effects, Prolonged Hazard Exposure



- **Gaps in Access to Healthcare Persist.** Survey respondents weighed in on several topics ranging from their ability to pay for healthcare and attend medical appointments, and their desire for additional onsite healthcare services that may improve their wellbeing. While access to health care can be impacted by factors such as specific health conditions and socioeconomic variables, the survey painted a picture of gaps in access to both primary care and specialized care. As shown in Figure 5: Workforce Survey - Additional Onsite Medical Services the most desired additional onsite medical service was urgent care, a primary care function.

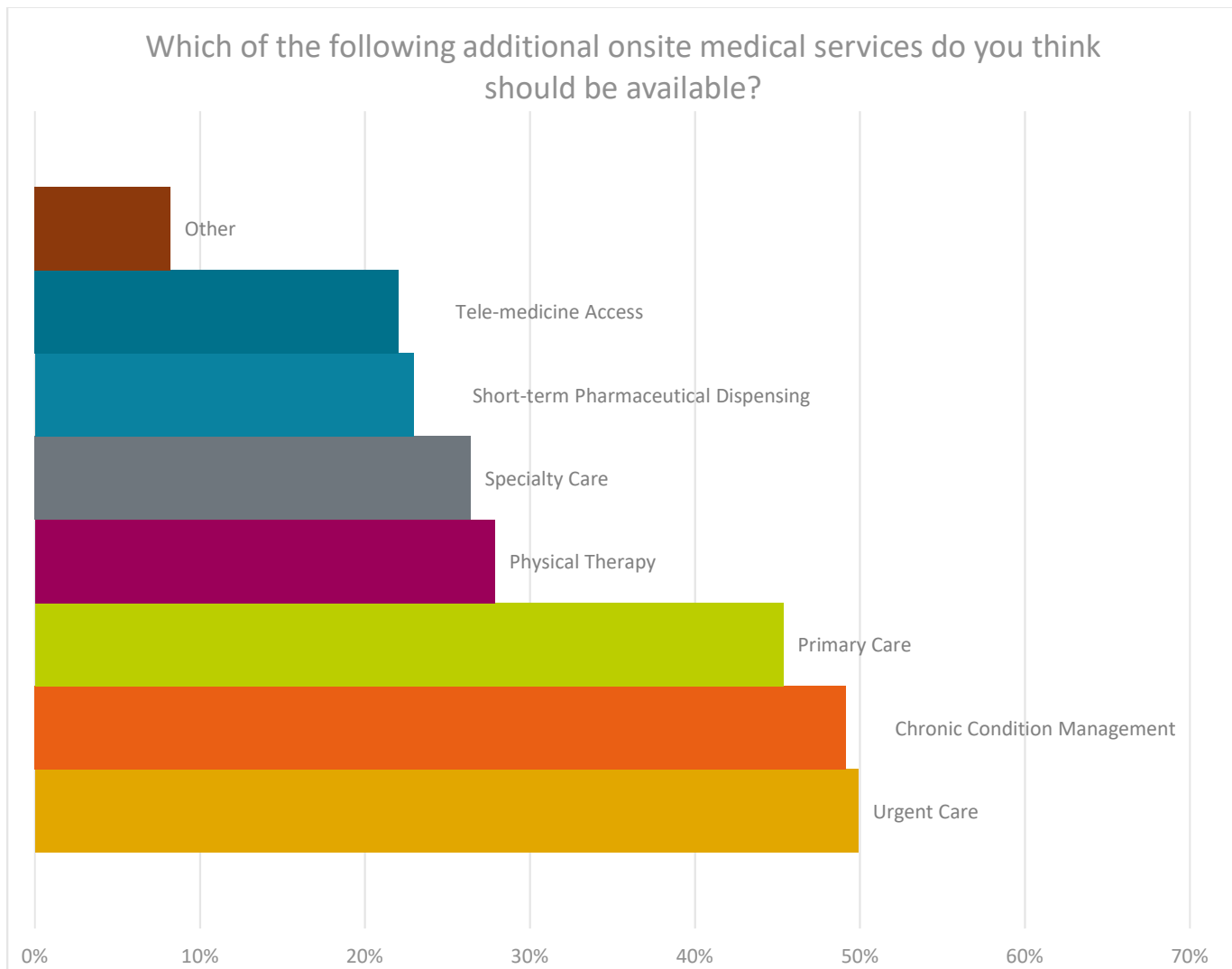


Figure 5: Workforce Survey - Additional Onsite Medical Services

- **Concern Expressed by Current and Former Workers.** Many narrative responses provided in the workforce survey expressed deep concerns about the fairness of workers' compensation system processes and the healthcare system's ability to meet workers' needs. Emotions of despair and distrust punctuated these narrative responses.
- **Care Coordination and Quality.** The workforce survey and provider interviews highlighted the complexity of managing long-term health effects for Hanford workers due to the often-delayed onset of exposure-related health conditions. A central finding is the important role of care coordination from initial

assessment/diagnosis to long-term follow-up care. Freeform responses to the workforce survey and provider interviews pointed to deficiencies in continued engagement with the worker after an initial assessment or diagnosis. The interviews with healthcare providers revealed the challenges coordinating long-term care, in part because many workers experience adverse effects many years after the exposure event. Workers indicated the presence of health problems long after initial diagnosis, sometimes more than 20 years later.

# Recommendations Framework

To effectively group similar recommendations for consideration, the Hanford Healthy Energy Workers Board developed a recommendations framework (Figure 6) to improve current and former Hanford workers' health care. The framework presents high-level groupings or themes for related recommendations. Each recommendation is a separate action to be considered by the Washington State Legislature and the Governor. The following sections describe the recommendation and provide additional discussion and assessment.

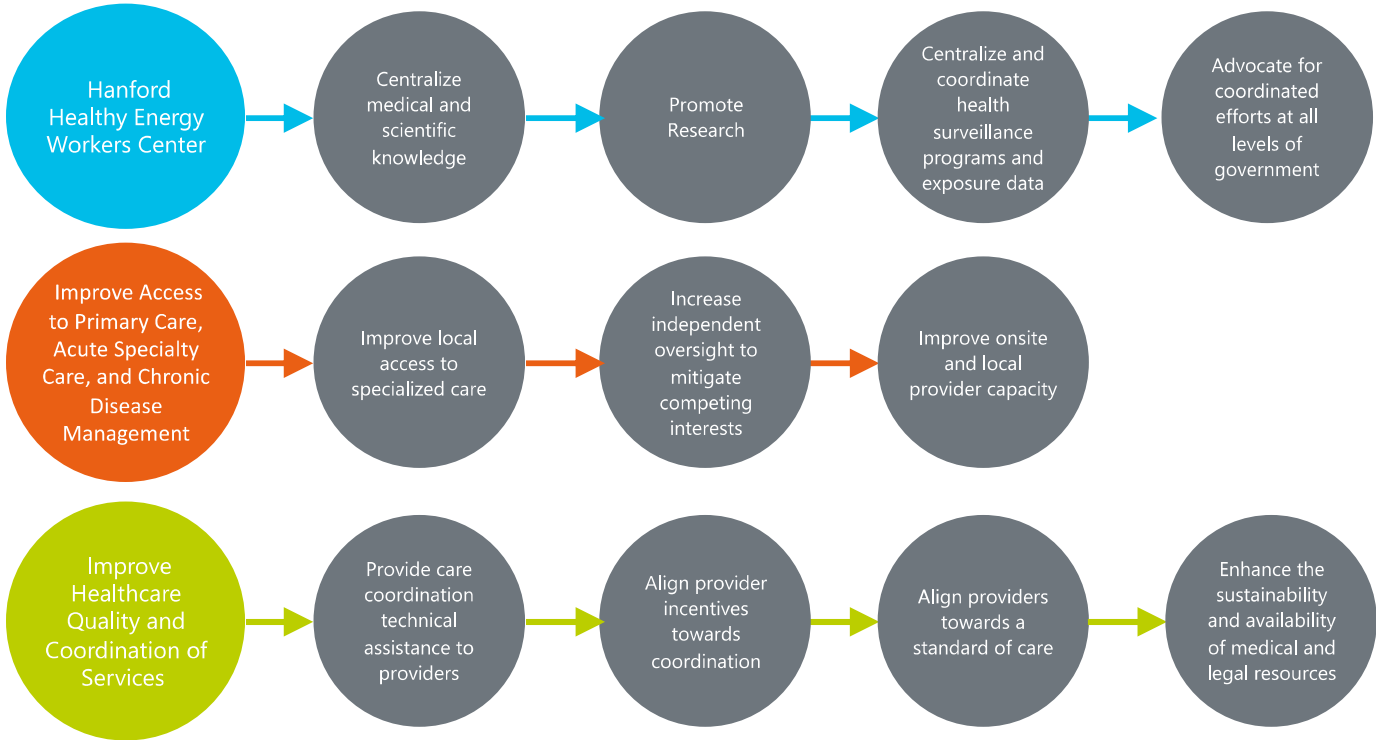


Figure 6: Recommendations Framework

# Hanford Healthy Energy Workers Center

The state should support a new center (Hanford Healthy Energy Workers Center) to:

- Establish an information clearinghouse for information promoting better access to healthcare,
- Improve quality of medical knowledge and training, and
- Improve transparency and effectiveness of information sharing.

In standing-up a new Hanford Healthy Energy Workers Center, the state should assign a standing advisory board made up of workforce representation, institutions of academic medicine, industrial hygienists, healthcare providers and the U.S. Department of Energy to ensure that all stakeholders' interests will be represented.

Currently, an easily accessible clearinghouse for exposure data and best health practices for Hanford workers does not exist. The lack of centralized information leaves room for uncertainty regarding the nature of exposure events and how they are associated with medical problems found in Hanford workers. This potentially slows down the process for treatment and ultimately delays patient care.

While individual healthcare information may currently be shared electronically and seamlessly between providers, population-level healthcare data is needed about the Hanford workforce in the areas to facilitate communication of best practices to inform treatment, additional research, and policy:

- Exposure data
- Medical surveillance trends
- Aggregated claims-related data

A clearinghouse for sharing healthcare information while still protecting patient privacy would help make healthcare delivery for Hanford workers more effective and efficient. Providers could go to one location to retrieve population-level workplace exposure data, related diagnostic trends, and potentially associated health conditions as well as individualized data. A centralized knowledge base could also increase the competency and efficacy of local primary care providers. Real-time data reporting in the clearinghouse could help guide the allocation of resources if certain communities were showing declines in follow-up care percentages.

The current and former workforce at Hanford is comprised of those who have worked for, or currently work directly for the U.S. Department of Energy as well as those who have worked for, or currently work for the numerous contractors that provide specialized services at the Hanford site. The disaggregated nature of this workforce makes consistent communication a challenge. A centralized source for Hanford-related healthcare information located within the Tri-Cities area, would go a long way towards building trust among a better-informed current and former Hanford workforce, particularly should the U.S. Department of Energy decide to participate as a partner.

## Proposal - Centralize medical and scientific knowledge

The state should establish and fund the Hanford Healthy Energy Workers Center as an independent, centralized entity to serve as a clearinghouse for disseminating peer-reviewed and accepted medical and scientific literature. Important functions would also include the evaluation and communication of newly available studies about Hanford-specific hazards and ongoing tracking of implemented healthcare practices.

## Assessment

The current health system creates “information silos,” which keeps information departmentalized. Providers must contact each other individually to share medical information and expertise. For incurable diseases such as chronic beryllium disease, information sharing could be key to finding cures. Current testing and treatment mainly target symptoms.

Centralized medical and scientific knowledge can also lead to improved practices beyond the medical community. Links to health outcomes and current safety practices are often reviewed regularly by many industries. DOE employees and contractors can also utilize the centralized medical and scientific knowledge base to re-evaluate their own on-site safety practices, in turn adjusting protection protocols and work place practices.

Centralized information sharing also helps ensure the credibility of knowledge through peer review. When studies are readily available for review, resulting best practices easily follow. Evidence-based practice is the leading cornerstone of current medical protocol. Having systems in place, which are updated quickly, is key to ensuring good patient outcomes.

Findings from the workforce survey indicated that many patients did not feel that their local providers effectively dealt with cases related to Hanford's health hazards. Many cases were referred to an outside specialist. A centralized knowledge base would help increase overall provider confidence in diagnosing and treating Hanford's acute cases.

## Proposal - Promote research

Continued research into potential health effects due to exposures and resulting healthcare needs is critical. The state should fund and promote research that influences the healthcare needs of current and former Hanford workers. The Hanford Healthy Energy Workers Center would serve as a point of coordination and priority setting for studies and initiatives help to address gaps in medical/scientific knowledge.

## Assessment

Collaborative research has proven beneficial in the past. It allows for multidisciplinary perspectives to many challenges in healthcare. Collaborative research also can create mentor relationships between specialties to increase overall competencies.

One way to encourage collaborative research is to create an academic journal published quarterly, authored by participating providers. Covered topics could include new incidence of disease related to Hanford exposure, new diagnostic techniques and new treatment plans.

Yearly conferences within the region where providers and other representation can meet would facilitate presentations of new research findings and create opportunities for training providers on diagnostics and treatment.

Additionally, prior assessments of tank farm vapors and the Chronic Beryllium Disease Program at Hanford have documented gaps and corrective actions regarding communications to the Hanford workers (Appendix A: Assessments of Hanford Worker Protection and Key Indicators of Progress). To help address this ongoing gap, the Hanford Healthy Energy Workers Center could serve in an outreach and educational function for workers seeking to understand current developments in protection, testing and treatment.

## Proposal - Centralize and coordinate health surveillance programs and exposure data

The ability to conduct an epidemiological study of health effects is inhibited by the division of health surveillance programs between the site's Occupational Medical Contractor for current workers and other programs for former workers. The state should establish the Hanford Healthy Energy Workers Center to serve as a point of data aggregation, coordination and evaluation of various health surveillance programs, including Hanford site exposure data. The Hanford Healthy Energy Workers Center will independently report and expand upon health surveillance information currently publicly available, such as annual Population Health Trending Summaries<sup>4</sup> provided by DOE.

### Assessment

Exposure events can be entered into a database documenting time, type of occurrence and location of the event. This information will be the first step in proper data aggregation. This information should be accessible to not only healthcare workers but also labor leadership as well. This exposure data should be stored and managed by the Healthy Energy Workers Center. Outlying medical providers will also have access to this data to accurately diagnose work-related injury claims. This will also help reduce the risk of inaccurate reporting and waste.

When exposure data is accurately reported, coordinating efforts for treatment has the potential to drastically improve. The majority of current testing for beryllium disease-related incidents are diagnosed outside of local treatment areas. This creates a delay in care. Better coordination can help the center recommend further allocation of resources if a site or area experiences a greater number of exposure events.

After collecting data, it will be easier for either DOE or local labor leaders to suggest changes in areas that experience high levels of exposure events. For example, large numbers of respiratory events in a certain site could prompt leadership to push for stricter safety standards at that location. If greater events occur at a specific site, stronger health surveillance or screenings can be put into place, such as more frequent screenings or examinations.

## Proposal - Advocate for coordinated efforts at all levels of government

With support from the Washington State Legislature and the Governor, the Hanford Healthy Energy Workers Center would serve to coordinate health and labor policy advocacy activities at the federal, state and local level. An example of concurrent activities is the introduction of S.4363, the Toxic Exposure Safety Act of 2020<sup>5</sup>, which, if passed, would address the boundaries of what can be achieved alone at the state level. Additional advocacy and coordination among stakeholders and policy-makers would allow for input and refinements to this and other federal and state legislation.

### Assessment

The Hanford Healthy Energy Workers Center would provide a central data point for local and state government. Data from incidence reports, individual and population-level health effects and current safety practices would

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<sup>4</sup> HPMC Occupational Medical Services, 2020 Population Health Trending Summary, Tank Farm Hazardous Waste Worker, <https://hanfordvapors.com/wp-content/uploads/2020/10/TANK-FARM-Health-Trend-Summary-Report-2020-FINAL.pdf>

<sup>5</sup> Sen. Murray, Patty [D-WA] (Introduced 07/29/2020), <https://www.congress.gov/bill/116th-congress/senate-bill/4363>

be accessible for review. Local governments would be able to view incident data and potentially recommend local clinics to increase access to medical care. State and federal government agencies would be able to view data and help strengthen safety standards for practices that are producing high levels of health events.

# Improve Access to Primary Care, Acute Specialty Care and Chronic Disease Management

The state should expand access to Hanford onsite and Tri-Cities area healthcare services available to current and former Hanford workers.

## Proposal - Improve local access to specialized care

The state should provide expanded access to primary care, occupational medicine, pulmonology and chronic disease management by supporting and expanding evidence-based practices by onsite and local healthcare providers that are uniquely tailored to Hanford workers' health needs.

### Assessment

Currently, workers need to go outside of the Hanford site to obtain comprehensive medical care. Even local urgent care facilities are at least 10 miles or more away from the central Hanford site. Increasing timely access would greatly improve overall health for Hanford workers. Local healthcare clinics will need to increase their abilities to diagnose and treat common Hanford-related illnesses. Currently, patients are usually referred to outside specialists who are not in the surrounding area. In particular, healthcare providers reported a need for occupational medicine physicians and doctors willing to treat patients with beryllium-related health issues.

Half of survey respondents cited a need for onsite urgent care facilities (50%) and chronic condition management (49%). A significant proportion (45%) indicated the need for primary care for injuries and illnesses regardless of whether they were related to a worker's job.

## Proposal - Increase independent oversight to mitigate provider competing interests that impede healthcare delivery

Barriers continue to persist to workers effectively navigating both the workers' compensation health evaluation process and accessing necessary care. One significant barrier cited by the workforce is that healthcare providers often have to deal with competing interests and/or administrative barriers that may be at odds with the quality of care. An example of a potential competing interest is that a provider has engaged in a contract with DOE, to which it is solely accountable, to administer onsite healthcare services at Hanford. The state should evaluate the feasibility of increasing independent oversight of healthcare providers serving Hanford workers.

### Assessment

Workforce Survey respondents voiced ongoing concern about whether healthcare providers were able to deliver care in manner that was free of competing interests and whether providers were always allowed to act in the best interest of Hanford workers. If left unaddressed, these concerns will continue to erode the trust in the healthcare community and further endanger workers' willingness to engage with providers in their care. If Hanford workers do not trust their providers and do not take an active role in their own care, the quality of care ultimately suffers.<sup>6</sup> Low quality of care can then manifest itself in the form of poor treatment follow-up and the absence of shared decision-making between the patient and the provider.

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<sup>6</sup> Coulter, Angela. "Patient engagement—what works?" *The Journal of ambulatory care management* 35.2 (2012): 80-89.



By providing independent oversight, providers who care for Hanford workers can work freely and independently, in the best interests of Hanford workers.

## Proposal - Improve onsite and local provider availability and capacity

The state should assess the feasibility of improving, through state-purchased healthcare in Benton and Franklin County, the availability of specialty care such as pulmonology, occupational medicine, and oncology.

### Assessment

Current local and regional health systems often refer Hanford workers' cases to outside specialists, some out of state. Hanford workers expressed in the survey that local providers are not equipped to handle their needs, thus possibly leaving the community underserved by the healthcare system.

Local specialty provider clinical availability should be targeted for improvement. Additionally, Washington State should consider increasing capacity for computerized tomography (CT scan), magnetic resonance imaging (MRI scan), bronchoscopy and disease-specific blood work should become available at local treatment sites. Patients should not have to wait until they can see an out-of-state or out-of-county clinic to receive a diagnosis. Diagnostic testing capacity for Hanford-related diseases can be cross-trained across the network.

# Improve Healthcare Quality and Coordination of Services

The state should support improved quality for the specialized healthcare services needed for the Hanford workforce through improved care coordination.

## Proposal - Provide care coordination technical assistance to providers

With support from the Washington State Legislature and the Governor, the newly established Hanford Healthy Energy Workers Center would provide technical and clinical practice assistance to local healthcare providers. One of the Center's key responsibilities would be to implement evidence-based practices of coordination of care for complex and chronic conditions, tailored to the Hanford workforce. Enhanced coordination capabilities should include enhanced care and case management across multiple provider systems

### Assessment

By offering technical assistance to providers, the Hanford Healthy Energy Workers Center can ultimately improve the care coordination for Hanford workers who have health conditions that are difficult to manage that may evolve over the course of several years. Coordinated case management does not currently exist for Hanford workers. Proper case management has been proven in the past on multiple platforms to help expedite and improve patient care and outcomes, particularly those with chronic conditions.<sup>7</sup>

## Proposal - Align provider incentives toward coordination

For state-purchased healthcare in Benton and Franklin Counties, the state should explore the alignment of provider incentives towards greater coordination of care and chronic disease management, particularly for the Hanford workforce and surrounding community. For example, the state can explore incentives in value-based purchasing.

### Assessment

Current coordination is limited to provider-to-provider phone calls, emails and faxes for shared communication for mutual patients. There is no existing coordination program or incentives for providers taking care of Hanford patients.

Incentives towards a percentage of reimbursement may help encourage participation in coordination programs. Benchmarks include timely submitted reports, participation in collaboration consortiums and attending yearly conferences for coordinated care for Hanford workers.

## Proposal - Align providers towards a standard of care

With support from the Washington State Legislature and the Governor, the Hanford Healthy Energy Workers Center should convene periodic conferences with the spectrum of providers that share in the care for Hanford workers (onsite Occupational Medical Provider, Tri-Cities area providers and institutions of academic

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<sup>7</sup> Wagner, Edward H. "Chronic disease management: what will it take to improve care for chronic illness?." Effective clinical practice 1.1 (1998).

medicine). Such conferences will help to establish a consensus standard of care for acute and chronic conditions related to work at Hanford.

## Assessment

There are currently no conferences for doctors, specialists and patient advocates to meet yearly regarding the care of Hanford workers. Annual conferences are commonly used in many different medical disciplines. Such conferences would help promote improved specialized care, peer accountability and improve current diagnostic techniques. This knowledge share for providers would complement the proposed data-sharing role of the Hanford Healthy Energy Workers Center. Providers could use the provider knowledge share to compare treatment practices while also pulling necessary data on exposure events, exposure materials and other data from the Hanford Healthy Energy Workers Center.

As mentioned previously, financial incentives for those providers attending a joint conference could help encourage participation. Topic and workshops covered during yearly conferences could also count toward Continuing Education Points, which providers must fulfill to renew a medical license.

As coordinated care improves, conferences could include attendees from multiple states, regions and countries. International collaboration focused on incurable diseases such as chronic beryllium disease could help catalog exposure data since no current database exists. Annual conferences would facilitate the re-evaluation of current standards for testing and treatment. The frequent yearly assessment would push to constantly improve practices in treating Hanford workers.

## Enhance the sustainability and availability of medical and legal resources for Hanford workers

The state should explore enhancing the medical and legal advocacy resources currently available to Hanford workers. This could include exploring the enhancement and augmentation of capabilities at the Hanford Workforce Engagement Center (HWEC)<sup>8</sup> and the exploration of independent and sustainable funding to support additional medical and legal advocacy resources.

## Assessment

Additional help is needed for potential claimants to navigate paperwork and legal issues. While HWEC currently assists claimants with completing paperwork, the demand for legal assistance by claimants may increase in the foreseeable future. In 2018, the Washington Legislature passed provisions for Hanford site workers allowing for prima facie presumption of certain occupation diseases.<sup>9</sup> Therefore, based on the law, certain diseases will be, on face, accepted as having been caused by work at Hanford until proven otherwise. The result is the removal of one of the most significant barriers faced by workers when establishing a workers' compensation claim for injury or illnesses related to their work at Hanford.

If the increased demand for legal and workers' compensation claim assistance is not met, Hanford workers will turn to private, personal injury legal practices who widely advertise their contingent-fee-based services. In the interest of keeping workers' compensation award dollars in the direct hands of Hanford workers, the board

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<sup>8</sup> The Hanford Workforce Engagement Center (HWEC) is service center staffed with experienced representatives equipped to help current and former Hanford employees and their families with their questions or concerns about occupational health issues. Assistance includes the completion of paperwork required to file a workers' compensation claim.

<sup>9</sup> Revised Code of Washington, RCW 51.32.187

recommends increasing the capacity of cost-free and independent legal and process assistance available to workers.

# Conclusions

## Washington State is Uniquely Positioned to Make a Difference

Based on the information gathered through the healthcare needs assessment, review of worker protection studies and review of health surveillance programs at Hanford, the board concludes that gaps exist in the healthcare system's ability to meet Hanford workers' needs. Based on these findings, the board encourages the state to continue and expand its leading role in improving Hanford workers' health and safety.

**Healthcare Needs Assessment.** The workforce survey and provider interviews reinforced that Hanford workers' health effects are complex and can present within a few hours or over the course of several years. By funding the Hanford Healthy Energy Workers Center, the state can help address the issues with care continuity and coordination, and the follow-up care that is needed for the unique exposures and resulting chronic health conditions experienced by current and former Hanford workers.

**Review of Worker Protection Studies.** Several assessments over time have pointed toward the need for further study to understand worker protection. These assessments have incrementally expanded the available knowledge, but in aggregate actionable findings are not readily available in a single, consolidated source for the public. The work to improve scientific knowledge and its availability will be a long-term effort. However, Washington State is well positioned to invest in a resource such as the Healthy Hanford Energy Workers Center to help serve the community with the best available resources and information.

**Review of Health Surveillance Programs at Hanford.** Health surveillance information is publicly reported as a result of the settlement agreement between DOE and Washington River Protection Solutions (WRPS).<sup>10</sup> However, the state has an opportunity to improve transparency and trust amongst all parties by establishing the Hanford Healthy Energy Workers Center as an independent clearinghouse for health surveillance information.

## Implementation Approach

- **Reconvene Hanford Healthy Energy Workers Board:** Since the Hanford Healthy Energy Workers Board does not continue in an official capacity beyond the preparation of this report to the Legislature, the Legislature and the Governor may consider reconvening this group to steer the implementation of the recommendations in this report. Members of this board remain committed to positive outcomes for the Hanford workforce and could be a valuable resource to steer future efforts towards addressing the healthcare needs of the Hanford workforce.
- **Implementation Roadmap:** The Hanford Healthy Energy Workers Board recognizes that implementing the recommendations outlined in this study will be a multi-year effort. A productive next step or priority for the board will be to collaboratively develop an implementation plan with Legislative and Executive Branch partners.
- **Convene Working Groups:** The board also recognizes that to implement the recommendations outlined in this report, an interdisciplinary, multi-agency effort may be needed. A natural next step for the board is to begin convening working groups based upon the recommendations framework to 1) developing high-level

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<sup>10</sup> In 2015, Hanford Challenge and the State of Washington filed separate citizen's suits against DOW and WRPS, alleging that vapors from the underground tank farms presented an imminent and substantial endangerment. In 2016, WPRS and HAMTC agreed to a settlement to implement a variety of corrective actions, including disclosure and reporting of health surveillance programs.

scope and requirements to implement recommendations and 2) develop detailed stakeholder engagement plans.

## Areas for Further Investigation

While the core mandate of the Healthcare Needs Assessment was to assess improved healthcare access and coordination, the board noted a few areas that warrant continued investigation.

### **Hanford Site Safety Culture**

Several respondents cited the fear of job loss or retribution as a potential barrier to utilizing the workers' compensation system or reporting workplace hazardous materials exposure, although there were no questions specifically addressing culture in the workforce survey. The board recommends that Washington State consider an additional study to assess Hanford site safety culture, and particularly whether there are any differences in the experiences of DOE and contractor employees.

# Appendix A: Assessments of Hanford Worker Protection and Key Indicators of Progress

## Protection Programs Assessments

Increased attention on the part of the greater Hanford community has led to a broad desire to evaluate policies and processes for the prevention of exposure in place at the Hanford worksite. Additionally, there is an increasing desire to improve medical evaluations of those Hanford workers who were or may have been exposed at the Hanford worksite.<sup>11</sup>

Since 1999, a number of workers were found to be sensitized to beryllium and some had been diagnosed with chronic beryllium disease (CBD). Additionally, tank farm workers (TFWs) showed increasing awareness and willingness to report “fugitive vapor emission” odors and/or symptoms. Together these trends contributed to oversight agencies’ intense focus on the programs and processes for preventing exposures and evaluation of workers.<sup>12</sup> Between 2010 and 2016, expert panels of evaluators from various independent agencies came to Hanford and performed careful analyses of the programs in place intended to protect workers from the unique hazards at the site: beryllium, beginning in 2010 and continuing into 2015 and tank farm vapors (TFV) beginning in 2014 and continuing into 2016. These assessment activities are summarized below. In 2016, the state of Washington, the Local 598 of the United Association of Plumbers and Steamfitters and the nonprofit organization Hanford Challenge filed a lawsuit resulting in a signed settlement agreement in 2018 that addressed many of the major remaining concerns of TFWs.<sup>13</sup>

## Chronic Beryllium Disease Prevention Program (CBDPP)/Beryllium Corrective Action Plan (BeCAP)

The Chronic Beryllium Disease Prevention Program (CBDPP) implements controls necessary to minimize the exposure to beryllium of employees working at Hanford. It provides employer requirements for Hanford found in 10 Code of Federal Regulations 850 (10 CFR 850<sup>14</sup>).

In response to concerns raised by external stakeholders regarding the adequacy of the 2009 implementation of the Hanford Site Chronic Beryllium Disease Prevention Program (CBDPP), the initial independent inspection was conducted during six visits over a period of five months in early 2010 by a team from the U.S. Department of Energy (DOE) Office of Health, Safety and Security (HSS) at the request of the Assistant Secretary for Environmental Management (EM). Follow-up evaluations took place annually, in 2011, 2012, 2013 and 2015.

## Assessments and Studies

- Department of Energy (DOE) Headquarters (HQ) Health, Safety and Security (HSS) Independent Oversight (IO) Inspection 2010<sup>15</sup>

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<sup>11</sup> Professional and personal knowledge and experience of former Hanford medical contractor Risk Communicator (2004-2019)

<sup>12</sup> Professional and personal knowledge and experience of former Hanford medical contractor Risk Communicator (2004-2019)

<sup>13</sup> Washington River Protection Solution, Settlement Agreement, [https://hanfordvapors.com/wp-content/uploads/2018/09/ENV\\_DEFENSE-853225-v1-Hanford\\_Vapors\\_Final\\_Signed\\_Settlement\\_Agreeme....pdf](https://hanfordvapors.com/wp-content/uploads/2018/09/ENV_DEFENSE-853225-v1-Hanford_Vapors_Final_Signed_Settlement_Agreeme....pdf)

<sup>14</sup> U.S. Department of Energy, Beryllium Program, <https://www.hanford.gov/page.cfm/Beryllium>

<sup>15</sup> Independent Oversight Inspection of the Hanford Site Chronic Beryllium Disease Prevention Program, [https://www.hanford.gov/files.cfm/2010\\_Hanford\\_Beryllium\\_Reportv3\\_final\\_June\\_20101.pdf](https://www.hanford.gov/files.cfm/2010_Hanford_Beryllium_Reportv3_final_June_20101.pdf)

- Hanford Corrective Action Plan in Response to HSS Beryllium Assessment Memo (BeCAP) (September 2010)<sup>16</sup>
- Independent Oversight Follow-up Review, Hanford Site - June 2011<sup>17</sup>
- Independent Oversight Follow-up Review, Hanford Site – Report of February 2013<sup>18</sup>
- Independent Oversight Follow-up Review, Hanford Site – January 2014<sup>19</sup>
- Enterprise Assessments Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program - June 2015<sup>20</sup>

## Findings/Corrective Actions / Recommendations

Area	Finding/Recommendation	Assessment
Communication	RL and ORP should identify actions to improve communications with stakeholder organizations and use their feedback and experience as a resource to improve the Hanford site CBDPP.	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Communication	RL should strengthen support mechanisms and communications with beryllium-affected workers	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Communication	RL, ORP and contractor organizations should identify actions to raise awareness by site managers and supervisors of the risks to workers associated with legacy beryllium contamination and to build trust among workers.	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Industrial Hygiene	Further defining the expectations for industrial hygiene evaluations prior to intrusive work activities was needed to ensure both a proper balance between production and safety and alignment within the BeCAP team prior to implementation.  Recommendation: Define IH evaluation process for intrusive work activities.	Independent Oversight Follow-up Review, Hanford Site – January 2014
Management	RL and ORP had not ensured that contractor baseline beryllium inventory and hazard assessments had been completed, as required by 10 CFR 850.20, 10 CFR 850.21 and the corresponding portions of the CBDPP.  Recommendation: RL and ORP should require operating contractors to develop and implement comprehensive implementation plans	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>

<sup>16</sup> Corrective Action Plan in Response to Office of Health, Safety and Security (HSS) Beryllium Assessment, [https://www.hanford.gov/files.cfm/10-SED-0161\\_CAP\\_in\\_Response\\_to\\_HSS\\_BE\\_Assmt1.pdf](https://www.hanford.gov/files.cfm/10-SED-0161_CAP_in_Response_to_HSS_BE_Assmt1.pdf)

<sup>17</sup> Office of Enterprise Assessments Independent Oversight Follow-up Review, Hanford Site - June 2011, <http://energy.gov/ea/downloads/independent-oversight-follow-review-hanford-site-june-2011>

<sup>18</sup> Independent Oversight Follow-up Review, Hanford Site - February 2013, <http://energy.gov/ea/downloads/independent-oversight-follow-review-hanford-site-february-2013>

<sup>19</sup> Independent Oversight Follow-up Review, Hanford Site – January 2014, <http://energy.gov/ea/downloads/independent-oversight-follow-review-hanford-site-january-2014>

<sup>20</sup> Enterprise Assessments Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program - June 2015, <http://energy.gov/ea/downloads/enterprise-assessments-follow-review-hanford-site-chronic-beryllium-disease-prevention>



Area	Finding/Recommendation	Assessment
Management	<p>WRPS, CHPRC, MSA and WCH had not ensured that their work planning and control processes and their implementation of those processes in beryllium-controlled facilities and areas were sufficient to fully ensure the protection of workers, co-located employees and transient personnel, as required by 10 CFR 850</p> <p>Recommendation: RL and ORP should promptly direct operating contractors to identify and prioritize identified deficiencies; RL and ORP should require operating contractors to develop and implement comprehensive implementation plans</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>On a priority and risk basis, RL and ORP should require operating contractors to develop and implement comprehensive implementation plans for completing efforts to achieve full and effective implementation of the site CBDPP.</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>RL, ORP and contractor organizations should determine methods to strengthen assessment and issues management processes for beryllium processes and activities.</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>RL, ORP and contractor organizations should identify appropriate, timely actions to ensure that accurate information about beryllium is available.</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>To ensure the long-term effectiveness of the CBDPP, RL and ORP should consider further formalizing expectations and governance of the CBDPP (i.e., maintenance and implementation).</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>DOE line management should ensure that adequate assessments of the CBDPP were performed.</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>EM should closely monitor site progress in implementing and improving the CBDPP at the Hanford site and take an active role in ensuring timely and effective implementation</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Management	<p>Baseline beryllium inventory and hazard assessments; develop a comprehensive improvement plan</p> <p>Recommendation: implement interim actions</p>	<p>Hanford Corrective Action Plan in Response to HSS Beryllium Assessment Memo (September 2010)</p>
Management	<p>Site contractors not ensured that processes in beryllium-controlled facilities and areas were sufficient to ensure protection completely.</p> <p>Recommendation: Develop a comprehensive improvement plan</p>	<p>Hanford Corrective Action Plan in Response to HSS Beryllium Assessment Memo (September 2010)</p>

Area	Finding/Recommendation	Assessment
Management	<p>RL, ORP and the four major Hanford site prime contractors were continuing to pursue the development of sitewide beryllium programs and processes to improve identification and control of beryllium hazards and were actively engaged in implementing the Hanford site BeCAP</p> <p>Recommendation: Ensure that valid assessments of BeCAP product implementation through surveillances or other assessment activities are conducted early to ensure correct implementation.</p>	Independent Oversight Follow-up Review, Hanford Site – Report of February 2013
Management	<p>A number of beryllium products had been reported as completed, but the only beryllium products reported as being implemented in the field were various interim actions as defined by RL, ORP and the beryllium work permit (BWP)</p> <p>Recommendation: Enhance mechanisms to ensure that interim changes to beryllium procedures (e.g., BWP Procedure), when required, are easily understood, manageable and readily accessible by the workforce.</p>	Independent Oversight Follow-up Review, Hanford Site – Report of February 2013
Management	<p>Four new associated procedures for beryllium posting, facility assessment and characterization/verification and beryllium sampling represent a significant accomplishment in the continued evolution of the Hanford beryllium program.</p> <p>Recommendation: Continue with the implementation of procedures.</p>	Independent Oversight Follow-up Review, Hanford Site – January 2014
Management	<p>Each of the contractors had begun some implementation of these new procedures and practices. Appropriate interim controls had been established to support implementation.</p> <p>Recommendation: Continue with the implementation of procedures.</p>	
Management	<p>Significant progress in closing and implementing numerous beryllium products, such that only 4 of the original 74 beryllium [administrative] products remained to be closed.</p> <p>Recommendation Identify the remaining CBDPP program activities needed to complete the implementation of all the DOE CAP items from 2010.</p>	Enterprise Assessments Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program - June 2015

Area	Finding/Recommendation	Assessment
Management	<p>The site had also begun to transition the CBDPP into the Hanford Site Standards process and expected to complete this transition by March 31, 2015.</p> <p>Recommendation: RL and ORP should provide direction to revise the Hanford Integrated Standards Management Plan to ensure that the CBDPP processes are consistent with other site-wide standards.</p>	Enterprise Assessments Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program - June 2015
Occupational Medical Contractor	<p>Considerable effort remains in completing and implementing the remaining products and in fully implementing each of the procedures across the Hanford site.</p> <p>Recommendation: Expedite the request and evaluation of cost impact proposals for the four primary Hanford site contractors and the medical provider for the few remaining beryllium products that have not been implemented due to cost impact.</p>	Enterprise Assessments Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program - June 2015
Processes	RL and ORP should consider ensuring that site contractors strengthen their processes for baseline beryllium inventories and hazards assessments.	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Testing	<p>AMH [now HPMC OMS] had not always analyzed medical, job and exposure data for employees diagnosed as sensitized or having CBD and thus was not collecting information needed to identify workers at risk for exposure, understand the beryllium health risks and identify appropriate actions to improve the CBDPP, as required by the CBDPP, 10 CFR 850.39 and 10 CFR 850.34.</p> <p>Recommendation: RL should promptly direct AMH to develop a comprehensive improvement plan</p> <p>RL, ORP and contractor organizations should identify appropriate, timely actions to ensure that accurate information about beryllium is available</p>	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Testing	RL should promptly direct AMH to develop a comprehensive improvement plan that addressed the deficiencies and opportunities for improvement identified in this report.	<a href="#">DOE HQ HSS Independent Oversight Inspection</a>
Testing	<p>The medical contractor had not always analyzed medical, job and exposure data for employees diagnosed as sensitized or having CBD</p> <p>Recommendation: Develop a comprehensive improvement plan</p>	Hanford Corrective Action Plan in Response to HSS Beryllium Assessment Memo (September 2010)

Area	Finding/Recommendation	Assessment
Training	<p>RL and ORP had not ensured that several categories of workers at the Hanford site were receiving the minimum beryllium-related training, as required by 10 CFR 850.37 and 10 CFR 851.25.</p> <p>Recommendation: RL, ORP and contractor organizations should identify appropriate timely actions to ensure that accurate information about beryllium is available</p>	<p><a href="#">DOE HQ HSS Independent Oversight Inspection</a></p>
Training	<p>RL and ORP should promptly direct operating contractors to identify and prioritize identified deficiencies (including those identified in this report and others identified by other assessments or gap analyses) and, where warranted, develop timely corrective actions and/or interim protective measures.</p>	<p><a href="#">DOE HQ HSS Independent Oversight Inspection</a></p>
Training	<p>Worker training related to beryllium</p> <p>Recommendation: Develop a comprehensive improvement plan</p>	<p>Hanford Corrective Action Plan in Response to HSS Beryllium Assessment Memo (September 2010)</p>
Training	<p>Much work remained to complete and implement the various processes and products associated with the BeCAP, including the processes and training for several key items, including building assessment and characterization processes and posting; Take steps to ensure that the beryllium sampling data communicated to workers through the BWP and BHA is useful, accurate and consistent and that it is as clear as possible with respect to risk.</p> <p>Provide clear and unambiguous training requirements in beryllium procedures to ensure that workers, subject matter experts, line managers and the training staff agree on the minimum training and qualification requirements for performing a beryllium work task</p>	<p>Independent Oversight Follow-up Review, Hanford Site – Report of February 2013</p>

## Key Indicators of Progress

Since the EA beryllium follow-up review in November 2013, there has been measurable progress in closing and implementing numerous beryllium-related corrective actions, such that only four of the original 74 beryllium recommendations remain unresolved. Based on limitations of more recent information that is publicly available, additional collaboration with DOE would permit a full assessment as to whether remaining corrective actions have been completed.

Additionally, according to the most recent EA beryllium review, each of the four Hanford site contractors has implemented, to some degree, the following:

- New CBDPP implementing procedures addressing BWPs and BHAs
- Building assessment and characterization/verification
- Beryllium posting/labeling
- Assessment, characterization and verification of structures and Conex boxes

- Evaluation of electrical equipment for beryllium.

## Tank Farm Vapor Assessments

### Assessments and Studies

- Tank Vapors Assessment Team (TVAT) – 2014<sup>21</sup>
- Center for Toxicology and Environmental Health (CTEH) Assessment of Technical Basis of TF IH Program – 2016<sup>22</sup>
- NIOSH Review TFW S&H Programs – 2016<sup>23</sup>
- OIG - Department of Energy’s Actions to Address Worker Concerns Regarding [retaliation for reporting] Vapor Exposures at the Hanford Tank Farms – Nov 2016<sup>24</sup>
- Vapors Management Expert Panel (VMEP) – Evaluate Implementation of TVAT’s Report Recommendations – 2016<sup>25</sup>
- DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017<sup>26</sup>
- Center for Toxicology and Environmental Health (CTEH) Re-Assessment of 2016 Assessment of Technical Basis of TF Industrial Hygiene Program – 2018<sup>27</sup>
- Settlement Agreement – 2018<sup>28</sup>

### Findings/Corrective Actions / Recommendations

Area	Finding/Recommendation	Assessment
Communication	Human physiologic response to odor plays major role in perception of toxic chemical exposure.  Recommendation: Education of workers concerning “basic toxicological odor biology principles” to “put into proper perspective [workers’] experiences with detected or ‘felt’ odors	Center for Toxicology and Environmental Health (CTEH) Assessment of Technical Basis <sup>29</sup> of TF IH Program – 2016

<sup>21</sup> Tank Vapors Assessment Team Final Report, 2014, [https://srnl.doe.gov/documents/Hanford\\_TVAT\\_Report\\_2014-10-30-FINAL.pdf](https://srnl.doe.gov/documents/Hanford_TVAT_Report_2014-10-30-FINAL.pdf)

<sup>22</sup> Technical Basis Evaluation Report, <https://hanfordvapors.com/wp-content/uploads/2017/03/CTEH-Tech-Basis-Eval-Report.pdf>

<sup>23</sup> Tank Farm Program Review, [https://hanfordvapors.com/wp-content/uploads/2016/12/NIOSH.Hanford.Tank\\_.Farm\\_.Program.Review.28.Nov\\_.2016.pdf](https://hanfordvapors.com/wp-content/uploads/2016/12/NIOSH.Hanford.Tank_.Farm_.Program.Review.28.Nov_.2016.pdf)

<sup>24</sup> Office of Inspector General, Special Report, <https://www.energy.gov/ig/downloads/special-report-oig-sr-17-01>

<sup>25</sup> Vapor Management Expert Panel, Independent Assessment, <https://hanfordvapors.com/reference-materials/independent-assessments/vapor-management-expert-panel-vmep/>

<sup>26</sup> Office of Enterprise Assessments Follow-up Assessment of Progress on Actions Taken to Address Tank Vapor Concerns at the Hanford Site <https://hanfordvapors.com/wp-content/uploads/2017/12/EA-32-Office-of-Enterprise-Assessments-January-2017.pdf>

<sup>27</sup> Re-assessment of the WRPS Industrial Hygiene Hanford Site Tank Vapor Program: Technical Basis and Implementation, <https://fsi1c2vb3k04dti1930vati1-wpengine.netdna-ssl.com/wp-content/uploads/2019/05/CTEH-Reassessment-Report-03042019-64393-000-SUB-001-001.pdf>

<sup>28</sup> Washington River Protection Solution, Settlement Agreement, [https://hanfordvapors.com/wp-content/uploads/2018/09/ENV\\_DEFENSE-853225-v1-Hanford\\_Vapors\\_Final\\_Signed\\_Settlement\\_Agreeme....pdf](https://hanfordvapors.com/wp-content/uploads/2018/09/ENV_DEFENSE-853225-v1-Hanford_Vapors_Final_Signed_Settlement_Agreeme....pdf)

<sup>29</sup> Industrial Hygiene (IH) Technical Basis document (Meacham *et al.*, 2006a) along with other supporting technical documents provides an overall summary of the WRPS IH program and includes reviews of the gas and vapor sources and dynamics, evaluation of head space composition, measurement of gases and vapors in the workers breathing zone, toxicological evaluation of volatile chemicals in tanks, prioritization of COPC and establishment of occupational exposure limits (OELs).

Area	Finding/Recommendation	Assessment
Communication	<p>Some workers have experienced odors and symptoms that they attribute to exposure to tank farm chemicals and either do not believe the data that DOE presents or that the data does not accurately characterize exposures.</p> <p>Recommendation: Continue to build trust. Acknowledge health concerns are legitimate. Increase management-worker interaction. Improve communication on return-to-work policy</p>	NIOSH Review TFW S&H Programs – 2016
Communication	<p>Hazards associated with tank farm vapor exposures have been evaluated through multiple studies and evaluations</p> <p>Recommendation: Improvements in communication be made to inform workers about the status of actions and to ameliorate continuing fear of retaliation on the part of some workers.</p>	OIG - Department of Energy's Actions to Address Worker Concerns Regarding [retaliation for reporting] Vapor Exposures at the Hanford Tank Farms – Nov 2016
Communication	<p>Various recommendations and that actions were underway to address issues.</p> <p>Recommendation: Improvements in communication be made to inform workers about the status of actions and to ameliorate continuing fear of retaliation on the part of some workers.</p>	OIG - Department of Energy's Actions to Address Worker Concerns Regarding [retaliation for reporting] Vapor Exposures at the Hanford Tank Farms – Nov 2016
Communication	<p>Seven of the 52 workers interviewed indicated that they had concerns with reporting, communicating, reprisal or fear of retaliation related to potential vapor exposures.</p> <p>Recommendation: Improvements in communication be made to inform workers about the status of actions and to ameliorate continuing fear of retaliation on the part of some workers.</p>	OIG - Department of Energy's Actions to Address Worker Concerns Regarding [retaliation for reporting] Vapor Exposures at the Hanford Tank Farms – Nov 2016
Communication	<p>Managing Tank Farm vapor issues is a challenge because of longstanding, complex issues in vapor characterization and the identification and control of fugitive releases and potential exposures to personnel.</p> <p>Recommendation: Improve communications and trust building.</p> <p>Increase worker involvement.</p> <p>Improve industrial hygiene and tank headspace sampling programs.</p>	DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017

Area	Finding/Recommendation	Assessment
Communication	<p>The CVST has contributed to development and implementation of some of the actions to address the TVAT supporting recommendations.</p> <p>Recommendation: Continue Chemical Vapors Solutions Team meetings and support.</p>	DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017
Communication	WRPS will post on a publicly available website the AOP-15 procedure.	Settlement Agreement – 2018
Communication	WRPS will post on a publicly available website all AOP-15 Event Investigation Reports	Settlement Agreement – 2018
Communication	WRPS will post on a publicly available website the following documents as effective on December 31, 2017: (1) procedures for determining appropriate PPE; (2) procedures for alternative respiratory protection assessments (“ARPAs”); (3) procedures for assessing worker hazards (including vapor risks); and (4) tank vapor information sheets (“TVISs”) for the COPCs in the tank farms.	Settlement Agreement – 2018
Communication	DOE and WRPS will make reasonable efforts to post on a publicly available website a monthly list of Problem Evaluation Requests (“PERs”) regarding AOP-15 events.	Settlement Agreement – 2018
Communication	DOE and WRPS will post on a publicly available website the Health Trending Summaries for tank farm workers.	Settlement Agreement – 2018
Communication	DOE and WRPS will post on a publicly available website a thorough explanation of the tank farm waste worker medical surveillance program (routine occupational tests and their purpose).	Settlement Agreement – 2018
Communication	DOE and WRPS will post on a publicly available website a thorough explanation of the current policy concerning return to work following a reported exposure and before the results of all medical tests are available.	Settlement Agreement – 2018
Communication	DOE will provide Hanford workers with information on a publicly available website regarding their potential ability to participate in the DOE Former Worker Medical Screening Program.	Settlement Agreement – 2018
Communication	DOE and WRPS promptly will post on a publicly available website the Health Process Plan entitled “PNNL-25791, Hanford Tank Farm Exposure and Risk Assessment Plan.”	Settlement Agreement – 2018
Communication	DOE and WRPS promptly will post on a publicly available website the Chronic Occupational Exposure Limits (OELs) With Regulatory Basis, PNNL-26777.	Settlement Agreement – 2018

Area	Finding/Recommendation	Assessment
Engineering Controls	<p>Many different areas of improvement such as new technologies, new requirements and procedures, new information and the introduction of new personnel with limited tank farm experience.</p> <p>Recommendation: An updated integrated control strategy should be documented incorporating the results of the new hazard understandings, abatement technologies, engineering controls, administrative controls and PPE examined or implemented.</p>	Vapors Management Expert Panel (VMEP) – Evaluate Implementation of TVAT’s Report Recommendations – 2016
Exposure Monitoring	DOE and WRPS will post on a publicly available website the results of the Phase Two testing of a NUCON Thermal Oxidation System	Settlement Agreement – 2018
Exposure Monitoring	DOE and WRPS will complete design for the optimal components and configuration of the Vapors Monitoring and Detection System (VMDS) for stack monitoring.	Settlement Agreement – 2018
Exposure Monitoring	DOE and WRPS will institute a process by which they will timely provide applicable TVISs and the worker’s personal exposure data.	Settlement Agreement – 2018
Health Information Sharing	DOE will direct the Hanford occupational medical services provider that, upon request from a tank farm worker, the provider will timely provide its medical data related to the worker.	Settlement Agreement – 2018
Industrial Hygiene	<p>TVAT developed a hypothesis that vapors coming out of tanks in high concentration (bolus) plumes sporadically intersected with the breathing zones of workers.</p> <p>Recommendation: Sample proactively the head space of tanks.</p> <p>Accelerate development and implementation of a revised industrial hygiene exposure assessment strategy.</p> <p>Utilize real time personal detection and protective equipment technologies</p>	Tank Vapors Assessment Team (TVAT) – 2014
Industrial Hygiene	Utilize real time personal detection and protective equipment technologies	WRPS – Tank Vapor Assessment Team Implementation Plan
Industrial Hygiene	<p>Technical Basis is sound from both a toxicological and industrial hygiene standpoint.</p> <p>Recommendation: Create a set of Acceptable Occupational Exposure Limits (AOELs)</p>	Center for Toxicology and Environmental Health (CTEH) Assessment of Technical Basis of TF IH Program – 2016



Area	Finding/Recommendation	Assessment
Industrial Hygiene	<p>WRPS and the DOE have taken positive steps to help resolve concerns regarding exposure to tank farm vapors and gases.</p> <p>Recommendation: Increase focus on engineering controls. Acknowledge health concerns are legitimate.</p>	NIOSH Review TFW S&H Programs – 2016
Industrial Hygiene	<p>DOE and WRPS have also collected a significant amount of data they believe demonstrates worker exposures are very low.</p> <p>Recommendation: Develop an evidence-based rationale for the tank farm perimeter. Reduce reliance on respiratory protection.</p>	NIOSH Review TFW S&H Programs – 2016
Industrial Hygiene	<p>Progress was being made to inform workers and interested parties about the facts and challenges related to vapors and the strategies and activities related to worker safety.</p> <p>Recommendation: Development of a formalized vapors communication strategy.</p> <p>Engage in efforts to improve monitoring the atmosphere in and around the tank farms and tank farm workers on a continuous basis and/or right when workers smell something.</p>	Vapors Management Expert Panel (VMEP) – Evaluate Implementation of TVAT’s Report Recommendations – 2016
Industrial Hygiene	<p>WRPS has made progress in implementing actions to address the TVAT recommendations. The respirator cartridge testing station has the potential to provide more confidence in the adequacy of lower levels of respiratory protection.</p> <p>Recommendation: Continue progress. Improve industrial hygiene and tank headspace sampling programs.</p> <p>Improve communications and trust building.</p>	DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017
Industrial Hygiene	<p>Several new types of personnel monitoring and vapor detection equipment are being prototyped.</p> <p>Recommendation: Improve industrial hygiene and tank headspace sampling programs.</p>	DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017

Area	Finding/Recommendation	Assessment
Industrial Hygiene	<p>The IH program has been strengthened.</p> <p>Recommendation Continue improving industrial hygiene and tank headspace sampling programs.</p>	DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017
Industrial Hygiene	<p>WRPS has achieved measurable progress in evaluating and deploying new detector technologies to better detect, characterize and report the results of potential acute vapor exposures on a real-time basis.</p> <p>Recommendation: Continue improving industrial hygiene and tank headspace sampling programs.</p>	DOE Office of Enterprise Assessment (EA-32) Follow-Up Assessment – 2017
Industrial Hygiene	<p>WRPS had taken to improve the defense-in-depth strategy for tank farm worker health protection increased confidence in the level of worker protection.</p> <p>Recommendation: The intervals between review of new headspace and source sampling and analysis data to update the tank vapor chemical list should be better defined.</p>	Center for Toxicology and Environmental Health (CTEH) Re-Assessment of 2016 Assessment of Technical Basis of TF Industrial Hygiene Program – 2018
Industrial Hygiene	<p>Identified opportunities for improving the way technical and procedural information is conveyed to and received from the workforce</p> <p>Recommendation: A program for effective communication of IH data analyses should parallel updates of tank vapor inventories, toxicological assessments and COPC and COC determinations</p>	Center for Toxicology and Environmental Health (CTEH) Re-Assessment of 2016 Assessment of Technical Basis of TF Industrial Hygiene Program – 2018
Industrial Hygiene	<p>Chemical Worker training had been implemented for tank farm workers, including IHTs.</p> <p>Recommendation: A program for effective communication of IH data analyses should parallel updates of tank vapor inventories, toxicological assessments and COPC and COC determinations.</p>	Center for Toxicology and Environmental Health (CTEH) Re-Assessment of 2016 Assessment of Technical Basis of TF Industrial Hygiene Program – 2018
Industrial Hygiene	<p>IHTs had received specific training in risk communication and conversing during high-stress situations.</p> <p>Recommendation: A program for effective communication of IH data analyses should parallel updates of tank vapor inventories, toxicological assessments and COPC and COC determinations.</p>	Center for Toxicology and Environmental Health (CTEH) Re-Assessment of 2016 Assessment of Technical Basis of TF Industrial Hygiene Program – 2018

Area	Finding/Recommendation	Assessment
Management	<p>TVAT determined that the most likely scenario was that characterization methods (e.g., use of 8-hour time-weighted averages) were inadequate.</p> <p>Recommendation: Site contractor and DOE management actively demonstrate commitment to improve the current program.</p> <p>Implement measurable benchmarks.</p>	Tank Vapors Assessment Team (TVAT) – 2014
Management	<p>After the Hanford occupational medical services provider informs DOE of the anticipated completion date for the (HPMC OMS) Medical Data Study, DOE will inform Plaintiffs of that date.</p>	Settlement Agreement – 2018
Medical Evaluation	<p>WRPS had implemented many of the TVAT recommendations and other improvements while continuing to explore additional improvements.</p> <p>Recommendation: Development of better tools for tracking, integrating and aggregating data which would be extremely useful for informing health decisions and providing the best care for workers.</p>	Vapors Management Expert Panel (VMEP) – Evaluate Implementation of TVAT’s Report Recommendations – 2016
Medical Evaluation	<p>Occupational medical services (OMS) provider will inform workers of their rights to seek medical diagnoses from a qualified medical provider when workers report to the Hanford occupational medical services provider for symptoms possibly related to vapor exposure.</p>	Settlement Agreement – 2018
Medical Evaluation	<p>Analysis using Hill’s criteria<sup>30</sup> strongly suggests a causal link between chemical vapor releases and subsequent health effects, particularly upper respiratory irritation, experienced by tank farm workers.</p> <p>Recommendation: Modify the medical case evaluation process and reporting procedures.</p> <p>Investigate and pursue external research opportunities and partnerships.</p>	Tank Vapors Assessment Team (TVAT) – 2014
Testing	<p>Testing and eventual installation of a “Strobic Air” high-velocity fan.</p>	Settlement Agreement – 2018

<sup>30</sup> Hill's criteria for causation are a group of nine principles that can be useful in establishing epidemiologic evidence of a causal relationship between a presumed cause and an observed effect and have been widely used in public health research.

Area	Finding/Recommendation	Assessment
Testing	WRPS and HAMTC had entered into a memorandum of agreement (MOA) regarding respiratory protection of TFWs  Recommendation: Respirator mask cartridge testing to be carried out.	Settlement Agreement – 2018

## Key Indicators of Progress

In September 2018, the Department of Energy (DOE) and Washington River Protection Solutions, LCC (WRPS) signed a settlement agreement regarding lawsuits brought by Washington State and by Hanford Challenge and Local 598 of the United Association of Plumbers and Steamfitters. Washington State, Hanford Challenge and Local 598 filed lawsuits alleging that vapors from underground tanks, arranged in tank “farms” at the Hanford Nuclear Reservation (“Hanford”) in southeast Washington, “may present an imminent and substantial endangerment.”<sup>31</sup>

The agreement included deadlines and specifics for certain administrative, engineering and personal protective equipment (PPE) objectives. Administrative controls, engineering controls and PPE make up the trio of industrial hygiene principles of worker protection. Some objectives were in process or even completed by the time of the signing of the Agreement; others were met over the ensuing months before the pandemic intervened. (The settlement agreement included a “Force Majeure” clause, which allowed delays in meeting objectives in the event of an unforeseeable circumstance—something occurring that is beyond control of any or all parties.)

## Health Effects Studies

Various evaluations of exposures to and possible health effects from vapor emissions from underground storage tanks at the tank farms in the central portion of the Hanford nuclear site have taken place over the years. These evaluations have been documented and made publicly available, more so in recent years than prior to 2005. Many, if not all, evaluations, assessments and studies are now available through portals on the website of the primary contractor in charge of cleanup activities at the tank farms: Washington River Protection Solutions (WRPS). This is, in part, due to the requirements of the settlement agreement of 2018 of the lawsuit brought by Hanford Challenge, Local 598 and Washington State against USDOE and WRPS.

While many hazards—some unique to the Hanford site—pose threats (risks) to the Hanford workforce, the most frequently reported and studied are those of vapor exposures (odors) at the tank farms. Internal policy and procedure evaluations have been undertaken at other locations on the site after discovered or recognized potential hazard exposures occurred (e.g. radioactive materials; asbestos) and extensive evaluation and re-evaluation of protection from and health effects caused by the unique hazard, beryllium, have been required by external oversight bodies such as the DOE’s Office of the Inspector General, Office of Enforcement and Oversight and Office of Enterprise Assessments (EA-32).

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<sup>31</sup> Washington River Protection Solution, Settlement Agreement, [https://hanfordvapors.com/wp-content/uploads/2018/09/ENV\\_DEFENSE-853225-v1-Hanford\\_Vapors\\_Final\\_Signed\\_Settlement\\_Agreeme....pdf](https://hanfordvapors.com/wp-content/uploads/2018/09/ENV_DEFENSE-853225-v1-Hanford_Vapors_Final_Signed_Settlement_Agreeme....pdf)

The following is a listing of publicly available evaluations of tank farm vapor exposures and health effects with references and implications<sup>32</sup>. This review summarizes the existing literature and other available sources regarding occupational exposure to vapors from nuclear waste stored in underground storage tanks at Hanford Nuclear Reservation and the potential impact of these vapors on the health of workers. This encompasses self-reported symptoms from over 90 tank farm workers documented in a variety of assessments and the media; 20 years of surveillance data from over 5,000 tank farm workers; DOE former worker screening results; and a cohort mortality study of over 34,000 former Hanford workers, including tank farm workers.

## Assessments and Studies

The following synopses of reports and studies include the title of report or study; exposure era; population/occupation; report type; study population; and finding(s):

- HPMC OMS, Annual Report 2018 (2012-2017 covered) compared Tank Farm Workers lab results to other site workers in routine medical surveillance. Found among 4,415 workers that TFW was not a risk factor for abnormal blood, urine or lung tests<sup>33</sup>
- Eberlein SJ, Mandel JS, Harber PI et al. (2006) Health effects panel evaluation of pulmonary function and liver enzyme levels among Hanford tank farm, a case-control study of 5,000+ workers and found that TFW was not a risk factor for lung obstruction or elevated liver enzymes.<sup>34</sup>
- DOE, 2018 from 2014-2016 TFW total recordable cases (TRC), days away or restricted (DART) that of 2,000+ workers TRC, DART the rates for TF contractor were about 80% lower than comparable industries.
- ORISE, (Vicary and Ellis, 2009) from 2004-2008 compared TFW plus other workers in terms of absence and diagnosis, DOE (IISP) database compared 2,160 TFW to 18,642 not TFW and found that TFW had higher absence rates due to musculoskeletal and other diagnoses, not vapor linked.
- DOE, 2017 Period of potential exposure: 1943-2017 Exams carried out from 1997 to 2017. All DOE former workers underwent screening exam—a total of 89,081 workers (no control group). Noted asbestosis, pulmonary obstruction, beryllium sensitization and hearing loss. No other findings.
- Schubauer-Berigan, 2015 reviewed all radiation exposure data between 1944–1978 at five DOE sites. Cohort mortality 34,278 from Hanford; 119,196 overall Standardized Mortality Rate (SMR) 0.85. Only cause of death with SMR> 1 was mesothelioma/pleural disease (asbestos).
- Schubauer-Berigan MK, Daniels RD, Bertke SJ. (2015) Cancer mortality through 2005 among a pooled cohort of U.S. nuclear workers exposed to external ionizing radiation. *Radiation Research* 183(6): 620–631.<sup>35</sup>

## Key Indicators of Progress

Based on the review of publicly available studies, no additional recommended actions beyond those identified for the Beryllium or Tank Farm Vapors programs were identified. Additional collaboration with DOE and joint evaluation of the HPMC OMS annual report is needed in order to assess additional indicators of progress.

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<sup>32</sup> Cherry et al 2021; "The legacy of weapons grade plutonium production: Health status of Hanford complex workers who manage the waste," in press, *Toxicology and Industrial Health*

<sup>33</sup> HPMC Occupation Medical Services, Population Health Trending Summary, Tank Farm Hazardous Waste Worker [https://hanfordvapors.com/wp-content/uploads/2018/04/18-HPMC-OMS-PM-038\\_Attachment-2017-Report-TRAC-1654.pdf](https://hanfordvapors.com/wp-content/uploads/2018/04/18-HPMC-OMS-PM-038_Attachment-2017-Report-TRAC-1654.pdf)

<sup>34</sup> U.S. Department of Energy, Health Effect Panel Evaluation of Pulmonary Function and Liver Enzyme Levels among Hanford Tank Farm Workers, [https://www.hanford.gov/files.cfm/FOL\\_2019-00537\\_Response.pdf](https://www.hanford.gov/files.cfm/FOL_2019-00537_Response.pdf)

<sup>35</sup> Schubauer-Berigan, Mary K., et al. "Cancer mortality through 2005 among a pooled cohort of US nuclear workers exposed to external ionizing radiation." *Radiation research* 183.6 (2015): 620-631.

## Appendix B: Medical Surveillance Systems Inventory

For the purposes of developing the content and analysis for the inventory of medical surveillance, the project team utilized information released to Commerce from DOE after a Freedom of Information Act request and publicly available information. The information provided in this appendix reflects programs managed by the Occupational Medical Contactor as of March 18, 2021<sup>36</sup>.

Workplace exposures at Hanford can vary by job function, which is evaluated as part of an Employee Job Task Analysis (EJTA). The EJTA is an electronic document which is completed by every worker with their supervisor at Hanford and which describes and delineates many known or possible work hazards to which each employee might be exposed (and to what degree), depending on job title, location and hazard analysis. "The EJTA is an evaluation of current job hazards. The EJTA does not document historical exposures or represent potential exposures in case of an accident, incident or abnormal event. It is not an exhaustive list of all chemical or physical exposures that may have been encountered. The EJTA is not designed to evaluate or provide medical exams for potential past historical exposures on DOE sites. This information is shared with the occupational medical contractor and determines into which medical surveillance/monitoring programs the worker is placed.

The content of the medical evaluation varies from program to program. Some examples of Medical Programs are "Asbestos Worker," "Tank Farm Worker," "Tank Farm Entry," "Lead Worker," and many others, which are based on the assigned work for which the worker is qualified. Most programs include basic laboratory evaluation (complete blood count; chemistry panel; urinalysis) and chest x-ray. Additional blood and/or urine tests are included depending on specifics of the potential on-the-job exposures (e.g., lead; mercury).

Exposure protocol testing components are based on best practices/best medical science available. The medical contractor also uses the current list of chemicals of potential concern (COPCs) at the tank farms or similar data as one basis for exposure protocols.

While there are no specific biomarkers for most chemicals of concern, the medical contractor performs tests/exams to evaluate changes in target organ function that could indicate chemical exposure effects.

There are two beryllium programs: Beryllium Worker Program (for workers assigned to work in areas known or thought to have had beryllium contamination) or Beryllium Voluntary Program (for workers who know or think they were exposed to beryllium in previous work). The procedures for those programs are defined in the CBDPP, discussed in Appendix A. The complete procedure for beryllium disease testing can be found in the Beryllium Information Booklet. The essentials are listed in Table 1 below.

In Table 1: Hanford Medical Surveillance Components reflects hazards and programs as of 2018 utilized for the Hanford workforce.

Surveillance Program	Enrollment Method/ Eligibility Requirement	Questionnaire	Lab(s)	Chest X-Ray	Pulmonary Function	Electrocardiogram	Audiogram	Vision Screening	Physical Exam	Other
Animal Handler	EJTA	X	X	X	X				X	Vaccine

<sup>36</sup> HPMC, List of Surveillance Program Managed by the Occupational Medical Contractor (HPMC), 3/18/2021

Surveillance Program	Enrollment Method/ Eligibility Requirement	Questionnaire	Lab(s)	Chest X-Ray	Pulmonary Function	Electrocardiogram	Audiogram	Vision Screening	Physical Exam	Other
Asbestos Historical	De-enrollment from worker program OR	X		X	X				X	
	Worker answer on DOE Historic Health Exposure Questionnaire OR									
	Med provider order OR									
	Employer request									
Asbestos Worker	EJTA	X		X	X				X	
Benzene	EJTA	X	X		X				X	
Beryllium Voluntary	Worker Request	X	X	X	X				X	
Beryllium Voluntary-WASTREN	EJTA with worker request	X	X	X	X				X	
Beryllium Worker	EJTA	X	X	X	X				X	
Bloodborne Pathogen	EJTA									Vaccine
Cadmium Worker	EJTA	X	X	X	X				X	
Carcinogen Historical	Med provider order OR employer request	X	X						X	Fecal Test
Carcinogen Worker	EJTA	X	X							Fecal Test
Chromium (hexavalent) Worker	EJTA	X	X	X					X	

Surveillance Program	Enrollment Method/ Eligibility Requirement	Questionnaire	Lab(s)	Chest X-Ray	Pulmonary Function	Electrocardiogram	Audiogram	Vision Screening	Physical Exam	Other
Chromium Historical	De-enrollment from worker program OR	X	X	X					X	
	Worker answer on DOE Historic Health Exposure Questionnaire OR									
	Med provider order OR									
	Employer request									
Communicable Disease	EJTA	X	X							
Corrosives	EJTA	X			X				X	
Formaldehyde	EJTA	X			X				X	
Hazardous Material-Waste Worker	EJTA	X	X		X		X	X	X	
HME for Historical Exposure	Worker answer on DOE Historic Health Exposure Questionnaire OR	X	X		X	X	X	X	X	
	Med provider order									
Hearing Conservation Program	EJTA	X					X		X	
Laser Vision	EJTA	X						X	X	
Lead Programs	EJTA	X	X						X	
Mercury	EJTA	X	X				X	X	X	
Methylene Chloride	EJTA	X	X		X	X			X	



Surveillance Program	Enrollment Method/ Eligibility Requirement	Questionnaire	Lab(s)	Chest X-Ray	Pulmonary Function	Electrocardiogram	Audiogram	Vision Screening	Physical Exam	Other
Pesticides and Organophosphates	EJTA	X	X		X				X	
Polychlorinated Biphenyl Handler	EJTA	X	X						X	
Silica-Chrystalline-Worker	EJTA	X	X	X	X				X	
Silica-Crystalline-Historical	EJTA	X	X	X	X				X	
Synthetic Vitreous Fibers	EJTA	X		X	X				X	
Tank Farm Hazardous Waste Worker	EJTA	X	X	X	X		X	X	X	
Welding Fumes	EJTA	X	X	X	X				X	

Table 1: Hanford Medical Surveillance Components

Table 2: Associated Onsite Medical Services describes routine and post-exposure onsite services that may also gather clinical data such as bloodwork or chest x-rays used in monitoring.

Onsite Medical Service	Description
<a href="#">Pre-employment Physical Exams / Qualification</a>	Medical exam protocol is used to medically qualify individuals to perform specific types of work or work in specific environments. An example is the "respirator user" exam used to pre-qualify personnel to use respiratory protection.
<a href="#">Medical Monitoring</a>	Bloodwork, chest x-rays, spirometry, audiograms CBC and differential
<a href="#">Post-Exposure Lab Workup</a>	

Table 2: Associated Onsite Medical Services

## Additional Considerations

Other non-Hanford-based worker medical screening programs:

- Radiation Protection at Hanford. Since 1942, when the Hanford Site was just beginning to be developed for production of plutonium, the management team and scientists knew that a program was needed to protect workers from and train them about the hazards of radiation. Thus developed the Radiation Protection Program, also called the Radiation Control Program, which was implemented in the earliest months of the Hanford Engineering Works activities and continues to this day. The essence of the program is to assure that workers are knowledgeable about and protected from radiation exposure, as well as being monitored for possible external exposures or internal uptake of radioactive material. Extensive information is available concerning the technical elements of the program [footnotes here]. The Pacific Northwest Laboratory provides services for the US Department of Energy Richland Operations Office and Hanford contractors that include “external dosimetry measurements and evaluations, internal dosimetry

measurements and evaluations, in vivo measurements, radiological record keeping, radiation source calibration, and instrument calibration and evaluation".

- The National Supplemental Screening Program, conducted by Oak Ridge Associated Universities in conjunction with National Jewish Health, Comprehensive Health Services, Axion Health and the University of Colorado Denver. Its mission is to evaluate the health of former DOE workers who may have been exposed to hazardous substances at work. It provides free medical screenings to DOE workers who may have been exposed to hazards in the workplace. The NSSP collects data to help identify if these former workers have developed any health conditions related to workplace exposures, as well as any health conditions that arise as these workers age. DOE, through its Office of Health, has sponsored beryllium screening for former workers from many sites; a surveillance program for Rocky Flats radiation workers and several former workers, site-specific, health-screening programs.<sup>37</sup>
- The Building Trades National Medical Screening Program, conducted by CPWR - The Center for Construction Research and Training in conjunction with the University of Cincinnati Medical Center, Duke University Medical Center and Zenith American Solutions, Inc., provides free medical screening services to construction workers formerly employed at Department of Energy (DOE) nuclear weapons sites, who may be at risk for occupational illness.<sup>38 39</sup>

#### Worker Health and Safety of EHSS of DOE:

- Energy Employees Occupational Illness Compensation Program -- provides compensation and medical benefits to employees who worked at certain Department of Energy (DOE) facilities
- Former Worker Medical Screening Program -- provides ongoing medical screening examinations, at no cost, to all former DOE federal, contractor and subcontractor workers who may be at risk for occupational diseases. The FWP is supported by DOE's corporate health and safety program within the Office of Environment, Health, Safety and Security (EHSS) and reflects our commitment to the health and safety of all DOE workers - past and present - who have served the nation in its national security and other missions.
- Domestic Health Studies and Activities --conducts and supports health studies and other research activities to determine if DOE workers and people living in communities near DOE sites are adversely affected by exposures to hazardous materials from DOE operations
- International Health Studies and Activities -- support the health and safety mission of DOE and increased knowledge concerning the health effects of ionizing radiation

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<sup>37</sup> National Supplemental Screening Program (NSSP), <https://www.ornl.gov/nssp/>

<sup>38</sup> Building Trades National Medical Screening program, <https://www.btmed.org/>

<sup>39</sup> Building Trades National Medical Screening Program, <https://www.cprw.com/service/medical-screening/>

# Appendix C: Glossary

**ACGIH** American Conference of Governmental Industrial Hygienists

**AIHA** American Industrial Hygiene Association

**ALARA** As Low As Reasonably Achievable

**AMH** – AdvanceMed Hanford – the Hanford occupational medical contractor from 2004 to 2011 (Prior to that was HEHF—Hanford Environmental Health Foundation)

**AOELs** – Acceptable Occupational Exposure Limits

**AOP** Abnormal Operating Procedure

**BeLPT** – Beryllium Lymphocyte Proliferation Test—a biological test carried out on a person’s blood to determine whether sensitization to beryllium has developed. The test measures the response of certain white blood cells (lymphocytes) in the presence of varying dilutions of a beryllium sulfate solution. The more readily and rapidly the increase (proliferation) of these white cells, the more likely sensitization has occurred.

**Beryllium** – a metal that is used in many industries because of its lightness, malleability, conductivity and strength. It is often alloyed with copper and was used in materials in which uranium was clad during production of plutonium at various Department of Energy sites including Hanford.

**Beryllium sensitization** – an immunologic (“allergic”) reaction to beryllium caused by previous exposure, which can lead to chronic beryllium (lung) disease.

**BHA** – beryllium hazard area

**BWP** – beryllium work permit

**CBDPP** – chronic beryllium disease prevention program

**CHAT** Chemical Hazard Awareness Training

**CHPRC** – CHPRC is now CPCC – CH2MHill Plateau Remediation Company

**Chronic Beryllium Disease** – a lung disease caused by inhalation of and resultant sensitization to beryllium dust and/or beryllium oxidation products. It is similar to other chronic obstructive pulmonary diseases (COPD), particularly sarcoidosis. Sensitization can also occur from skin contact with beryllium.

**Conex boxes** – “Container Express” - large metal boxes used for storage and transport of materials by train or boat; typically, 6’x6’x8’ they can range up to 40’ long and more

**COPC** Chemicals of Potential Concern

**CTEH** Center for Toxicology and Environmental Health

**CVST** Chemical Vapor Solutions Team

**CWBT** Central Washington Building and Construction Trade Council

**DOE ORP** – Department of Energy, Office of River Protection

**DOE RL** – Department of Energy, Richland Office

**DST** Double-Shell Tank

**EA** Office of Enterprise Assessments

**Fugitive vapor releases** – vapor sources that are not associated with known emission points, such as ventilation stacks or breather filters.

**HAMTC** – Hanford Atomic Metal Trades Council – is the sole bargaining unit for the 14 unions that represent production and maintenance employees of the Hanford facility contractors. HAMTC represents approximately 2,700 workers.

**HPMC** - HPM Corporation

**HPMC OMS** – the Hanford occupational medical contractor from 2012 to present

**HWEC** – Hanford Workforce Engagement Center – a service center staffed with experienced representatives equipped to help current and former Hanford employees and their families with their questions or concerns about occupational health issues.

**IH** - Industrial Hygiene

**IHT** - Industrial Hygiene Technician

**IPT** - Integrated Project Team

**ISM** -Integrated Safety Management

LDCT - low dose computerized tomography (of lungs)

**MSA** –MSA is now HMIS – Mission Support Alliance

**NIOSH** National Institute of Occupational Safety and Health

**OEL** – Occupational Exposure Limit – the highest level of exposure to a toxic substance that has been established by knowledgeable and trusted authorities not to be harmful to human health.

**OEL**- Occupational Exposure Limit

OEL-C Occupational Exposure Limit – Ceiling Limit

**OJT** -On-the-Job Training

**ORP** -Office of River Protection

**OSHA** -Occupational Safety and Health Administration

**PBI**- Performance Based Incentive PID Photon Ionization Detector

**PNNL** -Pacific Northwest National Laboratory

**PTR-MS** -Proton Transfer Reaction Mass Spectrometry

**RL** - Richland Operations Office. The Richland office oversees work performed by contractors, as well as site infrastructure needs and many other programs that are necessary to ensure the safety of Hanford cleanup

**Risk Communication** – a set of principles describing effective communication in situations of high concern and low trust.

**SCBA** -Self-Contained Breathing Apparatus

**SEA** -Special Emphasis Area

**SRNL** -Savannah River National Laboratory

**SST** -Single-Shell Tank

**Tank Farm** – site of buried underground storage tanks (USTs) in which millions of gallons of highly radioactive and mixed toxic chemical waste are buried at the Hanford site. There are 18 tank farms at Hanford with a total of 177 USTs.

**Technical Basis** – reviews of the gas and vapor sources and dynamics, evaluation of head space composition, measurement of gases and vapors in the workers breathing zone, toxicological evaluation of volatile chemicals in tanks, prioritization of COPC and establishment of occupational exposure limits (OELs).

**TFW** – tank farm worker

**TVAT** Tank Vapor Assessment Team

**TVIS** – Tank Vapor Information Sheet

**TWA** -Time-Weighted Average

**VMEP** -Vapor Management Expert Panel

**VOC** -Volatile Organic Compound

**WCH** – Washington Closure Hanford

**White Card** - Those who apply for the Energy Employees Program (EEOICPA) and are awarded medical benefits will be issued a white card (Medical Benefits Identification Card) with their accepted illnesses listed on the front. Similar to a standard insurance card, whenever you receive medical care related to an accepted illness, you will show this card to have the costs covered under EEOICPA. The card can cover a wide variety of medical services including home nursing care.

**WRPS** – Washington River Protection Solutions

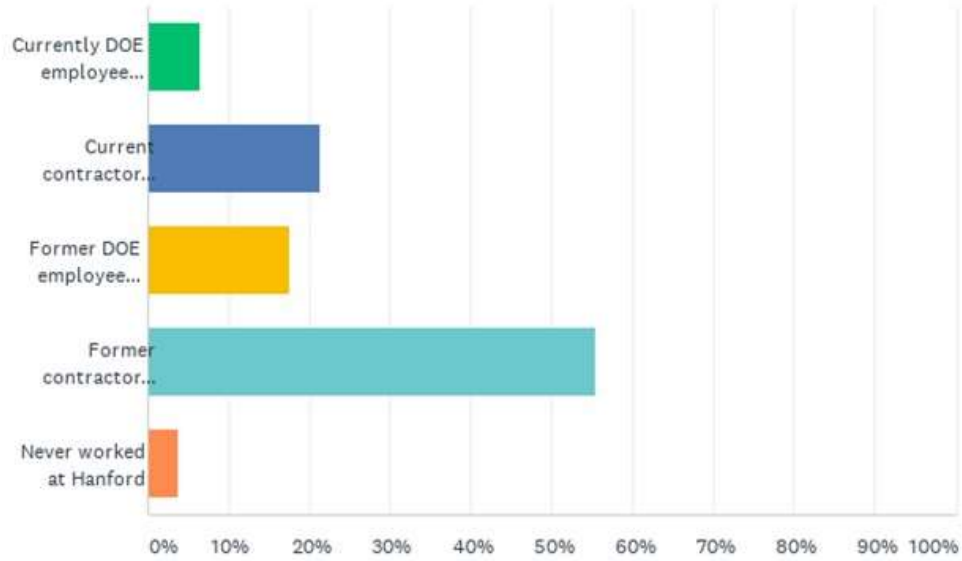


## Appendix D: Workforce Survey Results

The following appendix is an aggregation of results by question for the workforce survey. Additionally, for questions where respondents were asked to provide a free-form response, those raw responses have also been included.

**Q1: Are you a current or retired Hanford employee or contractor (on or off site)? Choose all that apply:**

Answered: 1,661 Skipped: 0



**Q1: Are you a current or retired Hanford employee or contractor (on or off site)? Choose all that apply:**

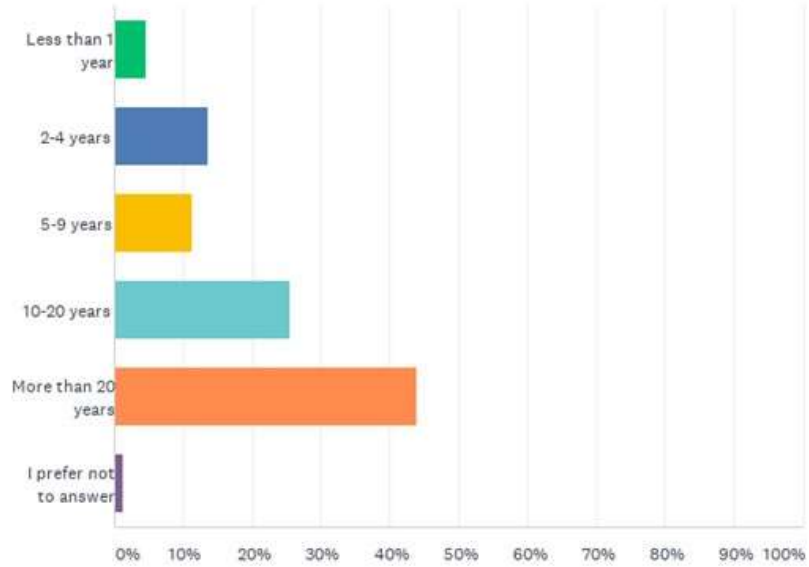
Answered: 1,661 Skipped: 0

ANSWER CHOICES	RESPONSES	
Currently DOE employee working at Hanford	6.50%	108
Current contractor employee working at Hanford	21.25%	353
Former DOE employee (including retired)	17.58%	292
Former contractor employee (including retired)	55.45%	921
Never worked at Hanford	3.85%	64
<b>Total Respondents: 1,661</b>		



**Q2: I have worked at Hanford for**

Answered: 1,533 Skipped: 128



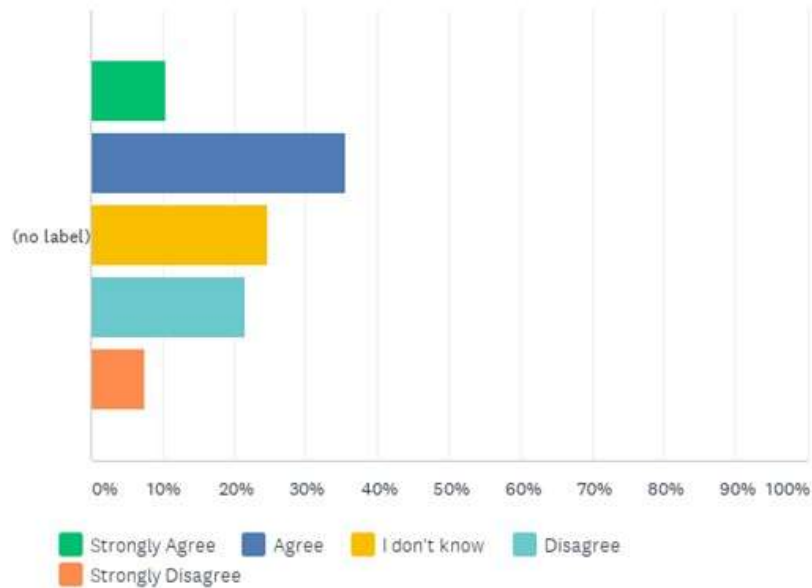
**Q2: I have worked at Hanford for**

Answered: 1,533 Skipped: 128

ANSWER CHOICES	RESPONSES	
Less than 1 year	4.50%	69
2-4 years	13.63%	209
5-9 years	11.22%	172
10-20 years	25.51%	391
More than 20 years	43.97%	674
I prefer not to answer	1.17%	18
<b>TOTAL</b>		<b>1,533</b>

**Q3: I am comfortable with the level of protection provided to prevent exposure to hazards unique to the Hanford Site.**

Answered: 1,506 Skipped: 155



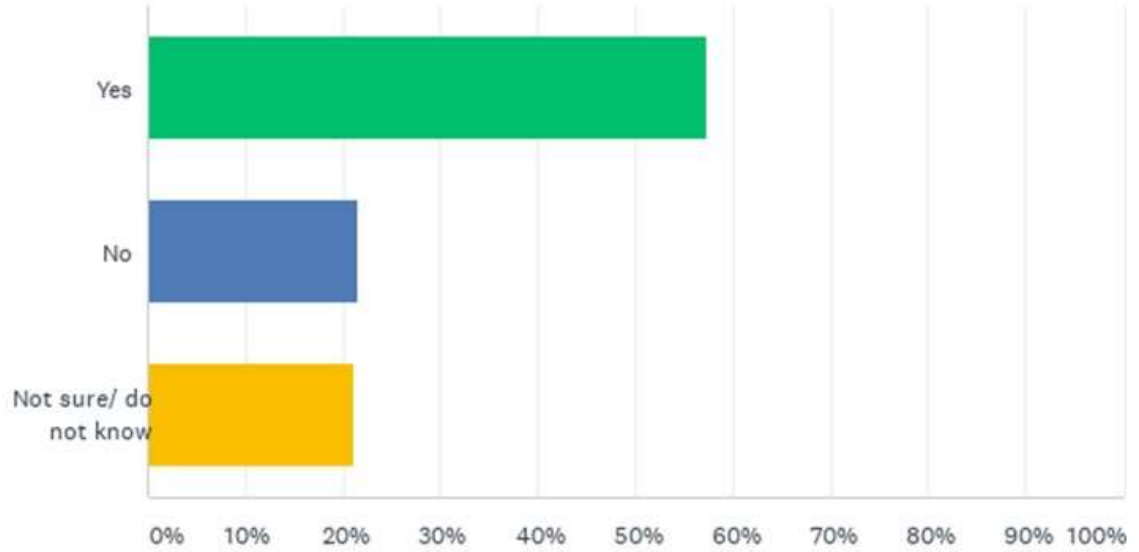
**Q3: I am comfortable with the level of protection provided to prevent exposure to hazards unique to the Hanford Site.**

Answered: 1,506 Skipped: 155

	STRONGLY AGREE	AGREE	I DON'T KNOW	DISAGREE	STRONGLY DISAGREE	TOTAL	WEIGHTED AVERAGE
(no label)	10.56% 159	35.66% 537	24.70% 372	21.58% 325	7.50% 113	1,506	2.80

**Q4: I have been in a radiological/ chemical/ particulate (e.g. silica, asbestos, beryllium) exposure event.**

Answered: 1,506 Skipped: 155



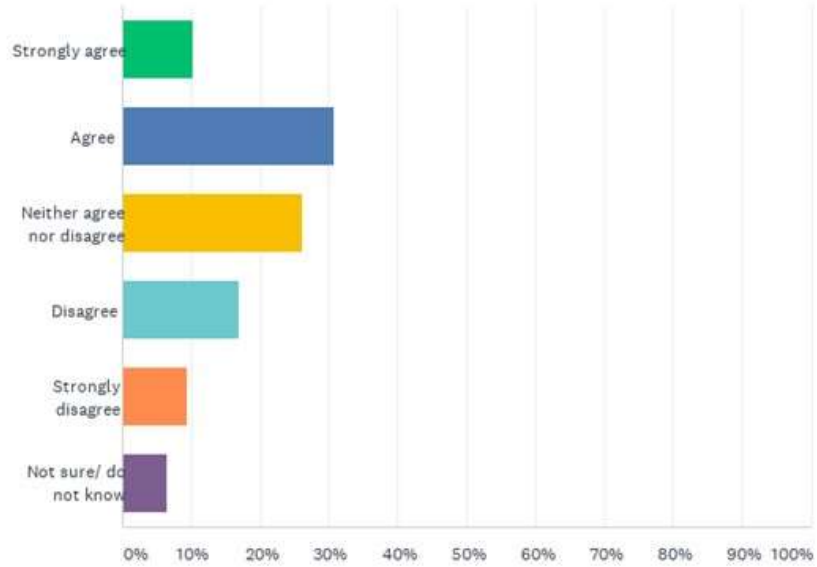
**Q4: I have been in a radiological/ chemical/ particulate (e.g. silica, asbestos, beryllium) exposure event.**

Answered: 1,506 Skipped: 155

ANSWER CHOICES	RESPONSES	
Yes	57.37%	864
No	21.58%	325
Not sure/ do not know	21.05%	317
<b>TOTAL</b>		<b>1,506</b>

**Q5: After an exposure event, I had prompt access to onsite medical care.**

Answered: 789 Skipped: 872



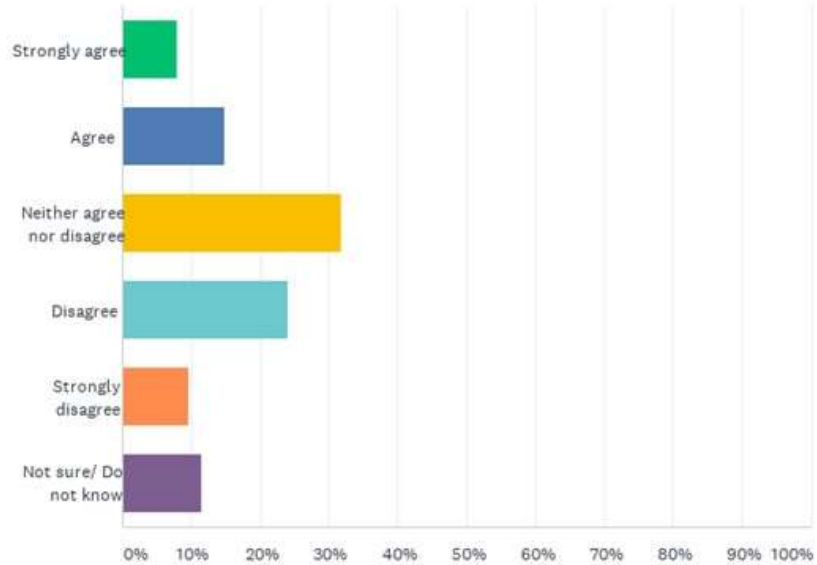
**Q5: After an exposure event, I had prompt access to onsite medical care.**

Answered: 789 Skipped: 872

ANSWER CHOICES	RESPONSES	
Strongly agree	10.27%	81
Agree	30.80%	243
Neither agree nor disagree	26.11%	206
Disagree	16.98%	134
Strongly disagree	9.38%	74
Not sure/ do not know	6.46%	51
<b>TOTAL</b>		<b>789</b>

**Q6: After an exposure event, I needed additional care from my primary medical provider or a specialist.**

Answered: 778 Skipped: 883



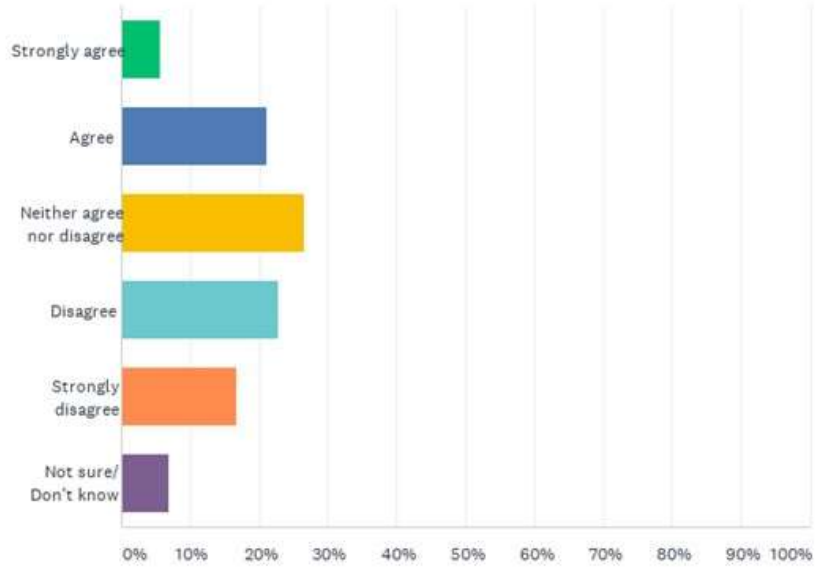
**Q6: After an exposure event, I needed additional care from my primary medical provider or a specialist.**

Answered: 778 Skipped: 883

ANSWER CHOICES	RESPONSES	
Strongly agree	7.97%	62
Agree	14.91%	116
Neither agree nor disagree	31.88%	248
Disagree	24.04%	187
Strongly disagree	9.64%	75
Not sure/ Do not know	11.57%	90
<b>TOTAL</b>		<b>778</b>

**Q7: After an exposure event, the health effects evaluation process was thorough and well explained to me.**

Answered: 774 Skipped: 887



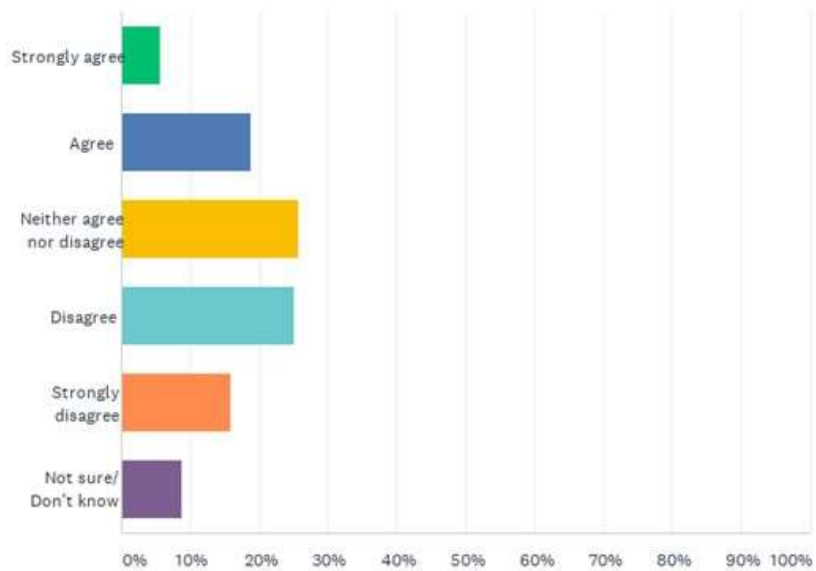
**Q7: After an exposure event, the health effects evaluation process was thorough and well explained to me.**

Answered: 774 Skipped: 887

ANSWER CHOICES	RESPONSES	
Strongly agree	5.68%	44
Agree	21.19%	164
Neither agree nor disagree	26.49%	205
Disagree	22.87%	177
Strongly disagree	16.80%	130
Not sure/ Don't know	6.98%	54
<b>TOTAL</b>		<b>774</b>

**Q8: I am confident that a medical evaluation after an exposure event would discover any potential health effects.**

Answered: 775 Skipped: 886



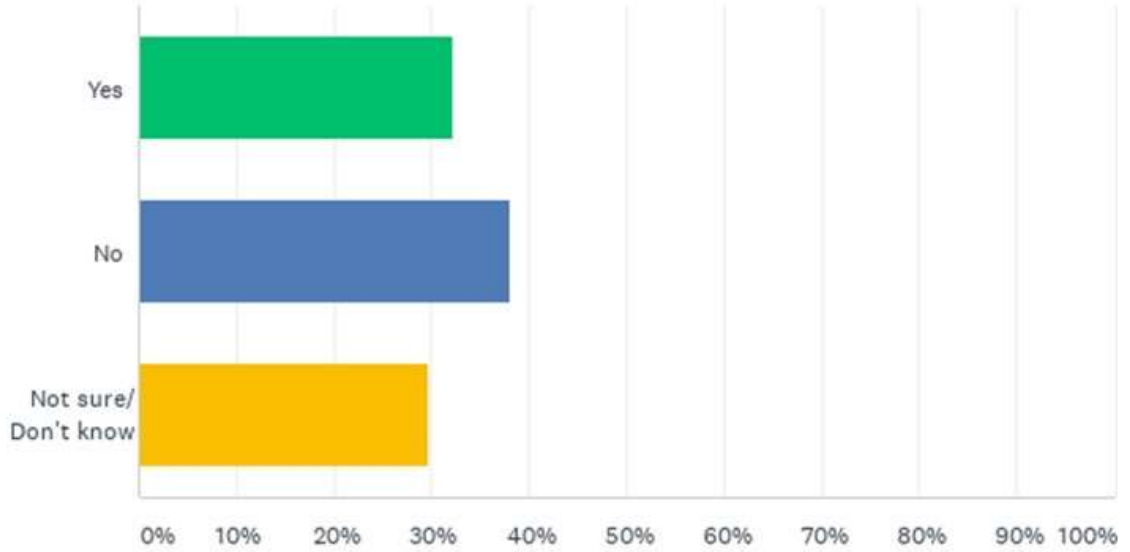
**Q8: I am confident that a medical evaluation after an exposure event would discover any potential health effects.**

Answered: 775 Skipped: 886

ANSWER CHOICES	RESPONSES	
Strongly agree	5.55%	43
Agree	18.84%	146
Neither agree nor disagree	25.81%	200
Disagree	25.03%	194
Strongly disagree	16.00%	124
Not sure/ Don't know	8.77%	68
<b>TOTAL</b>		<b>775</b>

**Q9: I have had prolonged radiological/ chemical/ particulate (e.g. silica, asbestos, beryllium) exposure.**

Answered: 1,401 Skipped: 260



**Q9: I have had prolonged radiological/ chemical/ particulate (e.g. silica, asbestos, beryllium) exposure.**

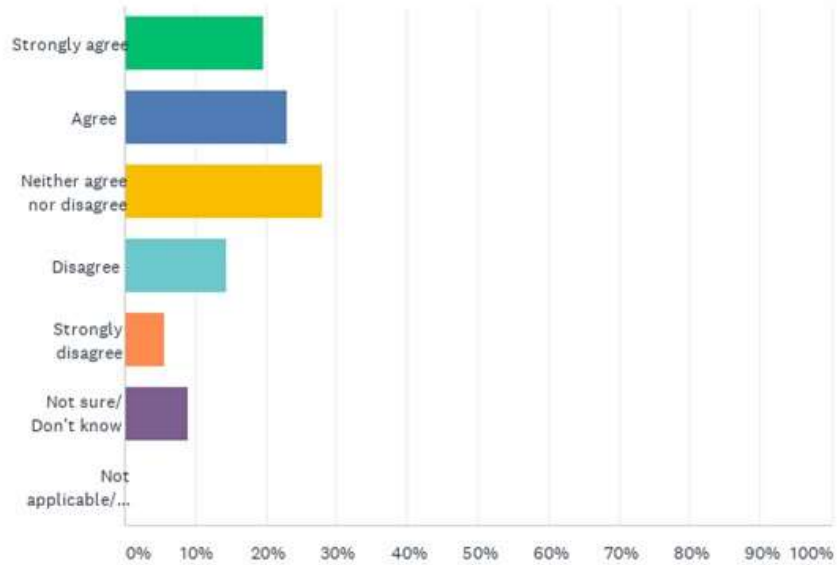
Answered: 1,401 Skipped: 260

ANSWER CHOICES	RESPONSES	
Yes	32.26%	452
No	38.04%	533
Not sure/ Don't know	29.69%	416
<b>TOTAL</b>		<b>1,401</b>



**Q10: After prolonged exposure, I needed additional care from my primary medical provider or a specialist.**

Answered: 442 Skipped: 1,219



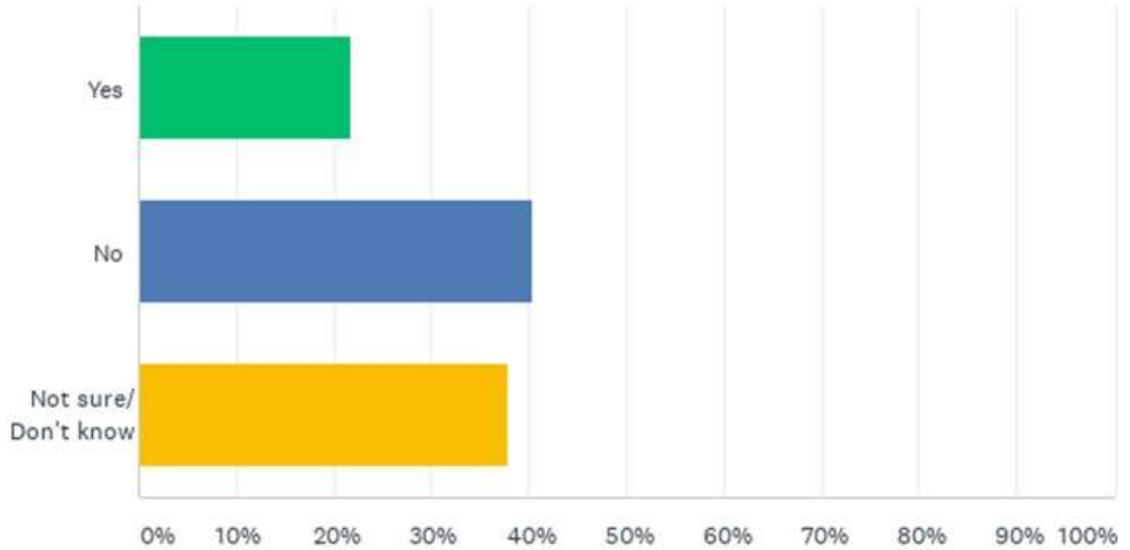
**Q10: After prolonged exposure, I needed additional care from my primary medical provider or a specialist.**

Answered: 442 Skipped: 1,219

ANSWER CHOICES	RESPONSES	
Strongly agree	19.68%	87
Agree	23.08%	102
Neither agree nor disagree	28.05%	124
Disagree	14.48%	64
Strongly disagree	5.66%	25
Not sure/ Don't know	9.05%	40
Not applicable/ Does not apply	0.00%	0
<b>TOTAL</b>		<b>442</b>

**Q11: I have had health effects due to short term (acute) hazardous material exposure from working at Hanford.**

Answered: 1,349 Skipped: 312



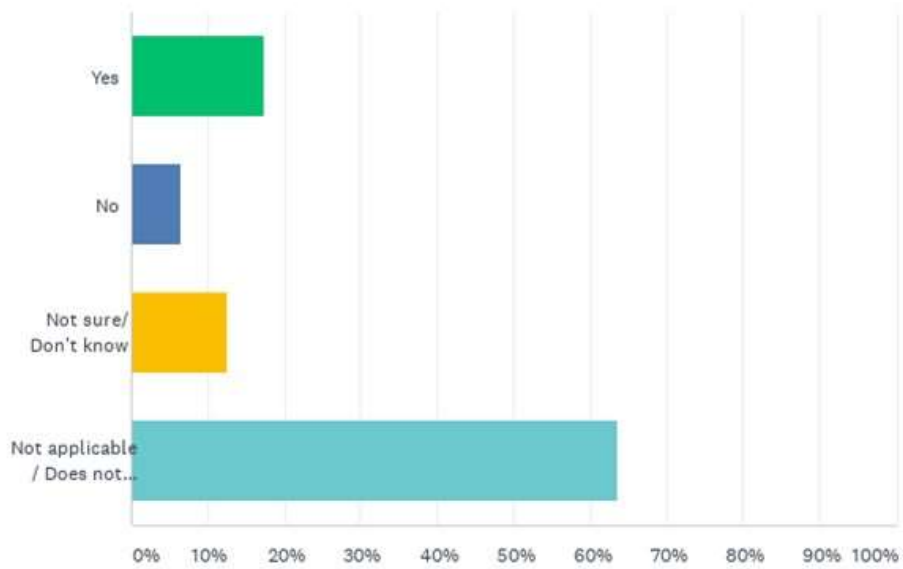
**Q11: I have had health effects due to short term (acute) hazardous material exposure from working at Hanford.**

Answered: 1,349 Skipped: 312

ANSWER CHOICES	RESPONSES	
Yes	21.72%	293
No	40.47%	546
Not sure/ Don't know	37.81%	510
<b>TOTAL</b>		<b>1,349</b>

**Q12: If you answered YES to the last question, has your health condition due to short-term (acute) exposure been diagnosed by a medical professional? (If you answered NO or NOT SURE please choose 'not applicable')**

Answered: 1,152 Skipped: 509



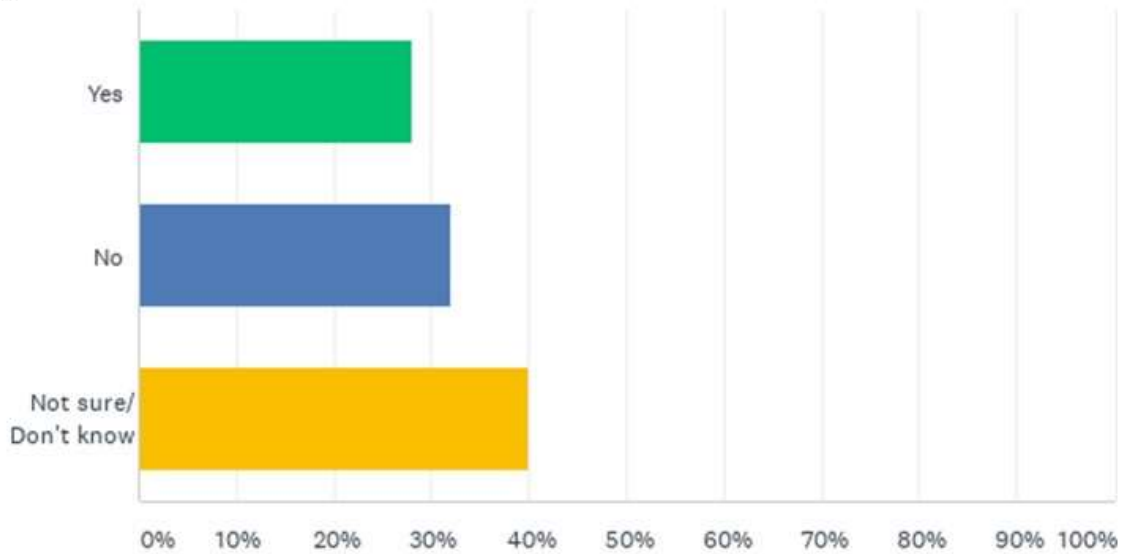
**Q12: If you answered YES to the last question, has your health condition due to short-term (acute) exposure been diagnosed by a medical professional? (If you answered NO or NOT SURE please choose 'not applicable')**

Answered: 1,152 Skipped: 509

ANSWER CHOICES	RESPONSES	
Yes	17.36%	200
No	6.51%	75
Not sure/ Don't know	12.50%	144
Not applicable / Does not apply	63.63%	733
<b>TOTAL</b>		<b>1,152</b>

**Q13: I have or have had health effects due to hazardous materials exposure over time from working at Hanford.**

Answered: 1,292 Skipped: 369



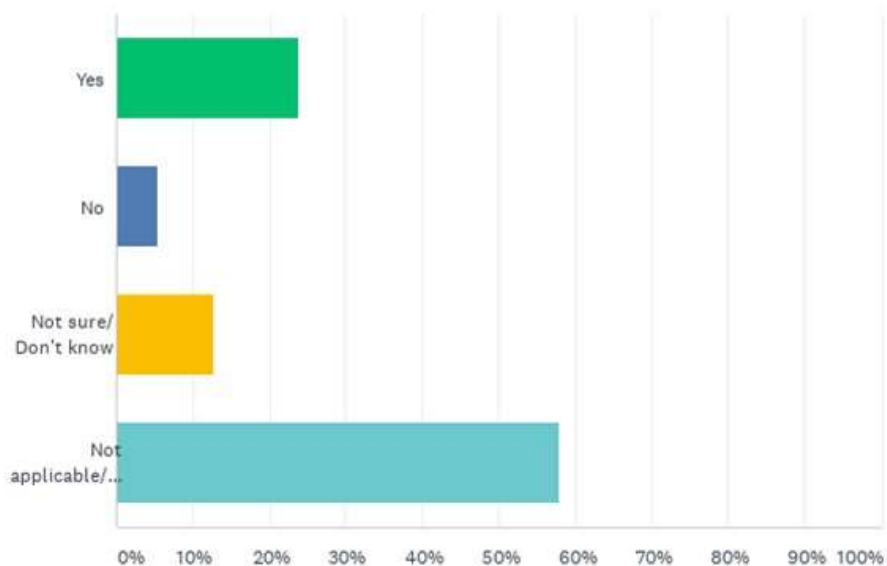
**Q13: I have or have had health effects due to hazardous materials exposure over time from working at Hanford.**

Answered: 1,292 Skipped: 369

ANSWER CHOICES	RESPONSES	
Yes	28.02%	362
No	31.97%	413
Not sure/ Don't know	40.02%	517
<b>TOTAL</b>		<b>1,292</b>

**Q14: If you answered YES to the last question, has your health condition due to exposure over time been diagnosed by a medical professional? (If you answered NO, or NOT SURE, choose 'not applicable')**

Answered: 1,140 Skipped: 521



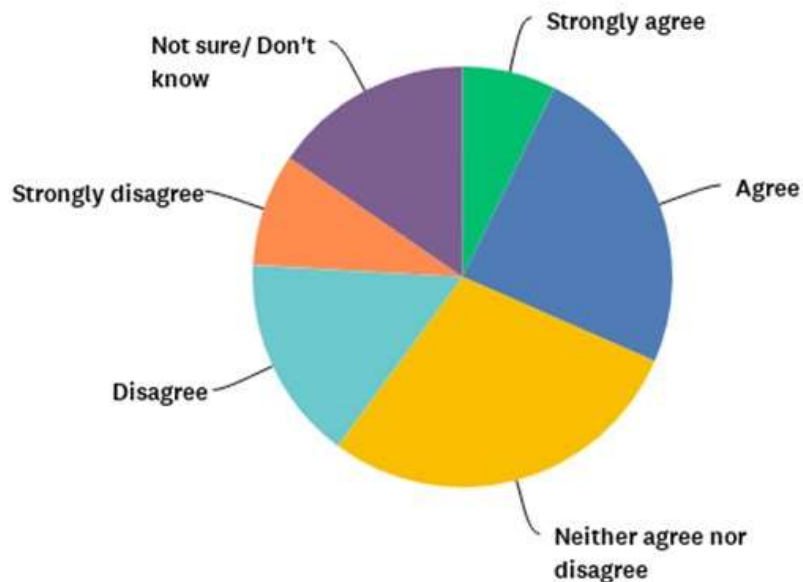
**Q14: If you answered YES to the last question, has your health condition due to exposure over time been diagnosed by a medical professional? (If you answered NO, or NOT SURE, choose 'not applicable')**

Answered: 1,140 Skipped: 521

ANSWER CHOICES	RESPONSES	
Yes	23.77%	271
No	5.44%	62
Not sure/ Don't know	12.81%	146
Not applicable/ Does not apply	57.98%	661
<b>TOTAL</b>		<b>1,140</b>

**Q15: The onsite medical staff are properly trained and equipped to deal with worker exposure to the Hanford site's unique health hazards.**

Answered: 1,232 Skipped: 429



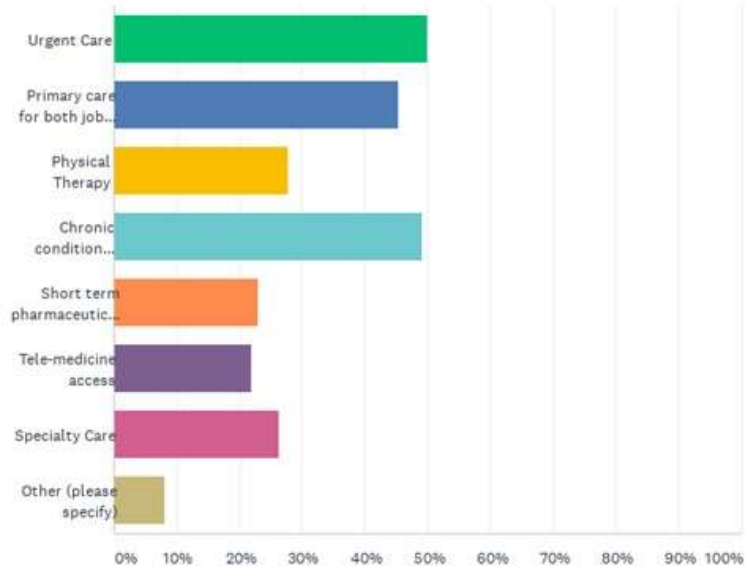
**Q15: The onsite medical staff are properly trained and equipped to deal with worker exposure to the Hanford site's unique health hazards.**

Answered: 1,232 Skipped: 429

ANSWER CHOICES	RESPONSES	
Strongly agree	7.22%	89
Agree	24.35%	300
Neither agree nor disagree	28.57%	352
Disagree	15.75%	194
Strongly disagree	8.69%	107
Not sure/ Don't know	15.42%	190
<b>TOTAL</b>		<b>1,232</b>

**Q16: Which of the following additional onsite medical services do you think should be available? Please select all that apply.**

Answered: 1,098 Skipped: 563



**Q16: Which of the following additional onsite medical services do you think should be available? Please select all that apply.**

Answered: 1,098 Skipped: 563

ANSWER CHOICES	RESPONSES	
Urgent Care	49.91%	548
Primary care for both job related and non job related illnesses and injuries	45.36%	498
Physical Therapy	27.87%	306
Chronic condition management	49.18%	540
Short term pharmaceutical dispensing	22.95%	252
Tele-medicine access	22.04%	242
Specialty Care	26.41%	290
Other (please specify)	8.20%	90
<b>Total Respondents: 1,098</b>		

Free Form Responses:

- More Specialists in diagnosing and treating chemical exposures are needed.
- Need better qualified non biased medical staff.
- Too many times in the past management and health services would perform feeble testing with no follow up. Most incidents would be conveniently explained away with some BS.
- 
- Access to someone other than a contact nurse. I had a very high exposure to Nox at the PUREX stack. The nurse had no idea what that meant and I had to insist that it be anoted in my medical records.
- Tracking cancer care
- Chronic lung - breathing problems
- The services are fine
- epi pen, oxygen, other emergency response medicine
- tax payers money...should see their own Doctor like everyone else
- Some exposures are immediately unknown. More training in labs of such possibilities. Even the radon gas in the air affects health.
- 
- Mental Health
- I do not trust any onsite medical services that are over seen by the US Government
- Independent Health Advocate
- Better communication and directions of nextcstep care
- Mental health issues
- IMMEDIATE ACCESS TO PROPER/CORRECT AND ACCREDITED WARRANTED MEDICAL ATTENTION, DIAGNOSIS AND PROPER CORRECT LIFESAVING TREATMENT AND PROCEDURES. END HARM. STOP INTENTIONAL MISDIAGNOSIS
- Advice, referral
- On the job injuries, yearly physicals
- There is no trust with on site anything
- All these are provided!
- Good as is.
- They had HEHF offsite where we went for medical care.
- Putting safety before the schedule for all, including requiring subcontractors



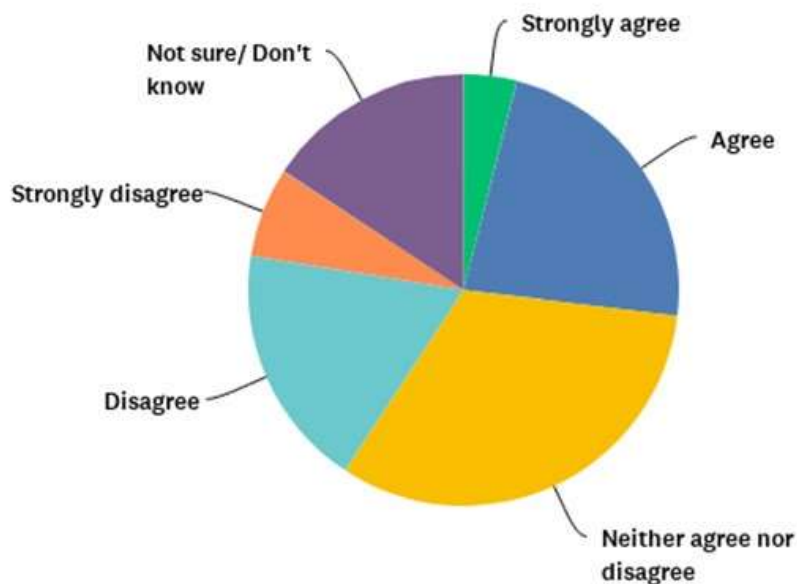
- X
- not sure of any onsite med
- Employed by staff that know what proper medical treatment is needed.
- Medical Advocates for staff when they feel unwell/ill. Staff need someone that can help staff through the medical system, because sometimes doctors don't make the right or complete diagnosis and when ill people aren't able to advocate for themselves or give up on being able to get help.
- Physiological care (mental health is important too)
- none. should be performed by a professional, off site with no ties to the Hanford site.
- a site setup like the veterans and neurotoxicity experts-Tim Jarvis-EEOICPA overlap Workers compensation claims
- Off site only.
- The Medical profession in the Tri-Cities refuse to take any stance against the Hanford Companies. I found out the hard way that local physicians are frightened and intimidated.
- All other should be off site doctors. .
- risk communication briefings both internal and external
- Endocrinology
- Need independent UW Occupational Health physician access on site
- Followup services are conditioned on specific events.
- Don't know
- They don't even have urgent care. HPMC is good for nothing- emergency care is a long way from site- HPMC is a joke- They'll send you home and tell you if the condition persists to follow up with your primary care provider.
- Continued assessment over time (even if symptoms aren't there)
- I think a place to work out to reduce the risk of health problems
- G
- NA
- Heavy metal detoxing
- Something different than what we currently have. I feel like the on site medical provider is only there to document for the company and not with the best intention of the sick or injured worker.
- testing

- GB none
- Be Honest With Exposure To Workers ... Quit Twisting What Happened To Me !!!
- None
- nothing more
- Low exposures over long period of time
- No needed help
- Any On-site care will be bias. That's how Hanford works.
- NONE
- radiological and chemical exposure wound care.
- Qualified Independent and unaffiliated Occupational Medicine doctor.
- N
- Dermatologist
- Chemical vapor exposure medical experts
- Long term evaluation for illness that is latent to materialize such as beryllium, asbestos or radiation exposures.
- Kadlec employees
- Management Needs ER Training - Seriousness is lacking
- None
- Medical service for all no matter who the contractor is (outside the fence)
- Blood draw within an hour of exposure not the 2-3 hours that is occurring
- Long term (multi year) followup of former, as well as, current employees who had exposure.
- Mental health services
- Cancer studies/detection
- Home health
- Follow up care and monitoring
- exposure amount was lost at Hanford Dosimetry
- I do not believe the tax payers should pay for any additional medical service for Hanford employees. It is not the employer's responsibility to address the employee's medical conditions that are not due to an exposure.
- Epidemiologist

- Cancer screening
- Pulmonologist
- Nothing else
- follow-up care
- 0 additional
- first aid. is this what is meant by urgent care?
- Home Live-In 24 Hour Care
- None needed. Just keep onsite staff reduced to reduce traffic
- referrals to offsite providers
- Don't trust
- Physical fitness and nutritional training should be available to all that want it
- Check periodically
- Gym
- MRI for lung check up
- Message

**Q17: Healthcare professionals in the Tri-Cities area are properly trained and equipped to deal with Hanford workers' healthcare needs.**

Answered: 1,203 Skipped: 458



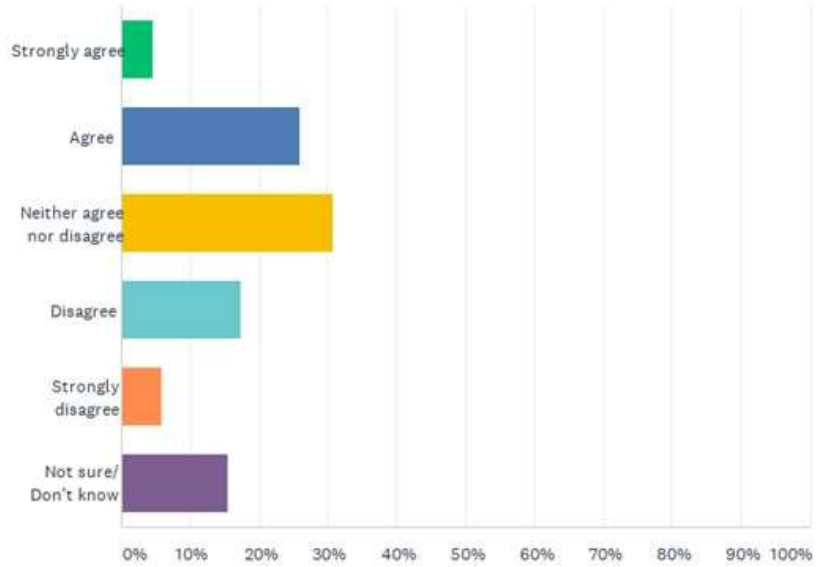
**Q17: Healthcare professionals in the Tri-Cities area are properly trained and equipped to deal with Hanford workers' healthcare needs.**

Answered: 1,203 Skipped: 458

ANSWER CHOICES	RESPONSES	
Strongly agree	3.99%	48
Agree	22.94%	276
Neither agree nor disagree	32.34%	389
Disagree	18.29%	220
Strongly disagree	6.73%	81
Not sure/ Don't know	15.71%	189
<b>TOTAL</b>		<b>1,203</b>

**Q18: Healthcare facilities (e.g., clinics, labs, and hospitals) in the Tri-Cities area are adequate to deal with Hanford workers' healthcare needs.**

Answered: 1,202 Skipped: 459



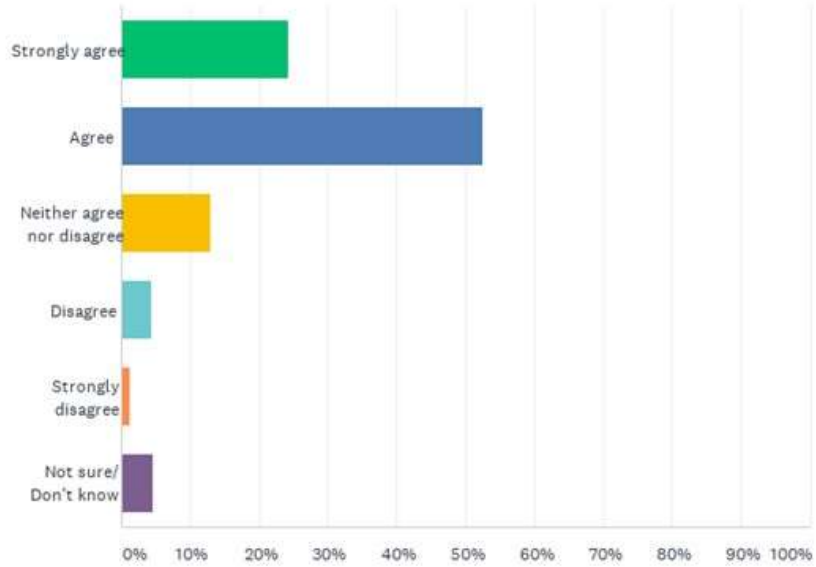
**Q18: Healthcare facilities (e.g., clinics, labs, and hospitals) in the Tri-Cities area are adequate to deal with Hanford workers' healthcare needs.**

Answered: 1,202 Skipped: 459

ANSWER CHOICES	RESPONSES	
Strongly agree	4.58%	55
Agree	26.04%	313
Neither agree nor disagree	30.78%	370
Disagree	17.30%	208
Strongly disagree	5.91%	71
Not sure/ Don't know	15.39%	185
<b>TOTAL</b>		<b>1,202</b>

**Q19: I have access to reliable transportation to medical appointments.**

Answered: 1,201 Skipped: 460



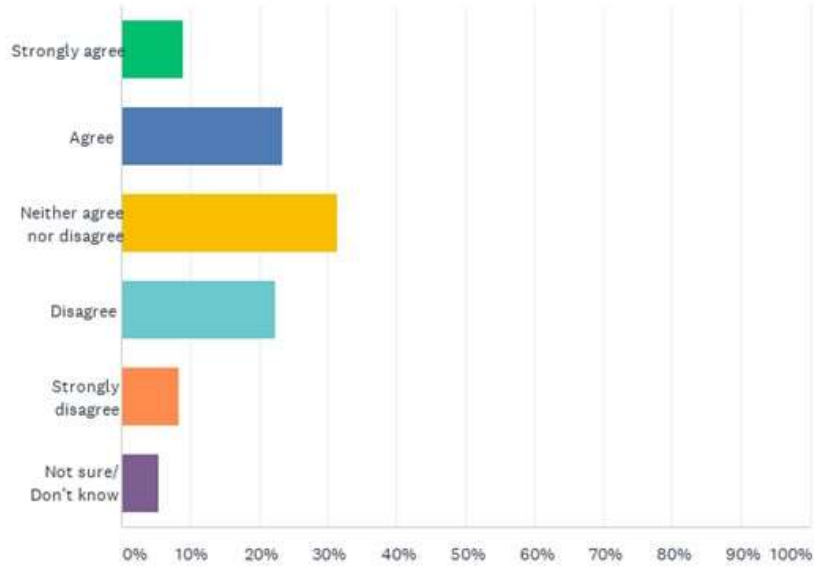
**Q19: I have access to reliable transportation to medical appointments.**

Answered: 1,201 Skipped: 460

ANSWER CHOICES	RESPONSES	
Strongly agree	24.31%	292
Agree	52.46%	630
Neither agree nor disagree	13.07%	157
Disagree	4.41%	53
Strongly disagree	1.17%	14
Not sure/ Don't know	4.58%	55
<b>TOTAL</b>		<b>1,201</b>

**Q20: My ability to pay for health care makes access to my medical services a challenge.**

Answered: 1,204 Skipped: 457



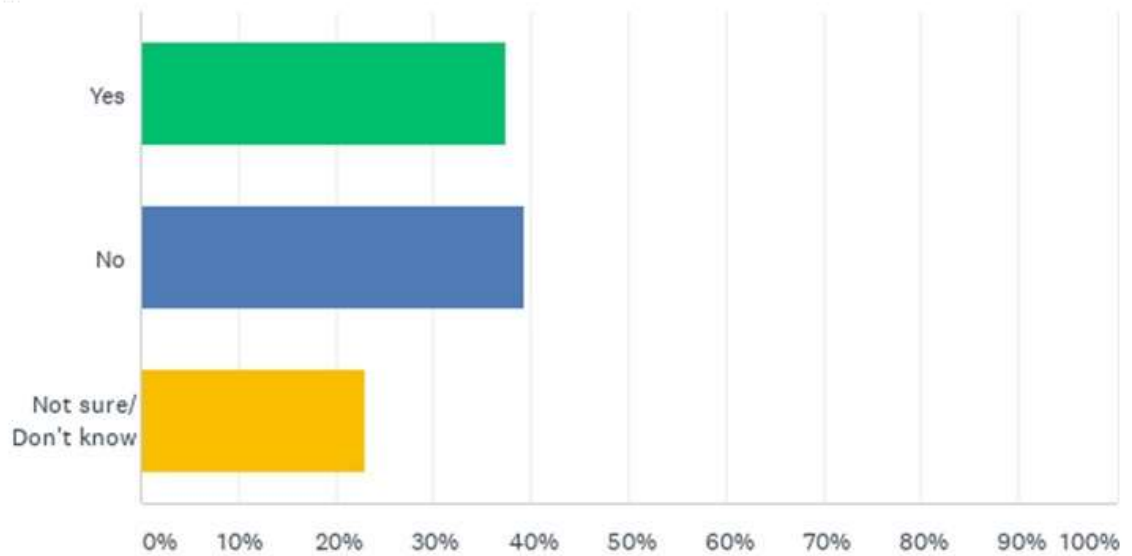
**Q20: My ability to pay for health care makes access to my medical services a challenge.**

Answered: 1,204 Skipped: 457

ANSWER CHOICES	RESPONSES	
Strongly agree	8.97%	108
Agree	23.34%	281
Neither agree nor disagree	31.48%	379
Disagree	22.43%	270
Strongly disagree	8.31%	100
Not sure/ Don't know	5.48%	66
<b>TOTAL</b>		<b>1,204</b>

**Q21: I have used my private health insurance rather than using the workers' compensation system for a work-related health issue.**

Answered: 1,175 Skipped: 486



**Q21: I have used my private health insurance rather than using the workers' compensation system for a work-related health issue.**

Answered: 1,175 Skipped: 486

ANSWER CHOICES	RESPONSES	
Yes	37.53%	441
No	39.40%	463
Not sure/ Don't know	23.06%	271
<b>TOTAL</b>		<b>1,175</b>

Freeform Responses



- Too damned many obstacles are thrown up to a get successful claim.
- faster
- Need things taken care of instead of having to wait for help
- I have a condition caused by my desk job with Hand ford Contractor and they caught it all the way instead of getting me help when I could have regained employment! I am now permanently disabled! Radiation isn't the only deadly issue employees have to worry about
- Prefer not to answer
- Wasn't sure what the condition is, doctors have not seen anything like it.
- Claim hasn't been approved.
- They don't believe what you tell them
- Cancer showed up years after exposure
- It was easier
- Because part of it due to the health problems and the other part is just regular health needs and so two separate billing is too complicated and assist easier to use my regular insurance because you jump through too many hoops and trying to find out what's going to get paid and what's not through the government
- Got laid off. Then had ear problems
- To not miss work and put the crew in a bad spot
- Much easier
- Didn't hav a test for beryllium wasnt aware
- The company won't support some my health care needs.
- Denied benefits!!!
- Did not think at the time my tumor was work related.
- So contractor doesn't hold it against me
- 
- the time it takes to get in to see someone for work is ridiculous
- newly dianosed
- It only covers specific items.
- Didn't know I could since retired
- Takes too long to get approval
- Other insurances were not available to me as I was working under sub contractors.

- It's not worth fighting with them to get the coverage
- Don't want the employer to get rid of me
- Because my condition was just recently accepted as being caused by my years at Hanford.
- Because I didn't want to be penalized by the company or have an investigation about why and how it happened. Easier to pay for it and be done without any questions.
- 
- Because I didn't know that muscle/skeletal could be considered workman's comp
- Employer was self insured couldn't stand pain while waiting for them to decide.
- could not prove cause was work related.
- still in claims process after 25 years since disability
- Didn't know if caused by onsite exposure.
- My claims have been continually denied because mywprk history has lost or misplaced in safe keeping at w.s.u.
- Easier
- Had no other choice.
- Cannot get approved for medical assistance through DOL.
- easier and quicker.
- Billing gets confusing at doctors offices. Hard to separate each appointment and which conditions I'm being seen for.
- Not covered
- Age
- .
- Good coverage
- no white card
- only choice.
- covered by the VA
- skin cancer on my left leg; didn't know if it was work related or not. unfamiliar with compensation process.
- Most efficient health source for me is my doctor
- Easier, don't have to prove work cause.

- Easier.
- Red tape involved when using DOL card
- do not have worker's comp.
- workers comp system is working against the workers bet interests. They are focused on denying claims.
- 
- I am not familiar with the Worker's Compensation program
- Hanford drags their feet and tries to delay and not pay
- Less paperwork, fewer questions and opinions from supervision
- I have used my white care for my breathing and skin medical problems only.
- Wasn't 100% sure if my hernia was from work.
- Provider miss billed, difficult to get them to reverse filing.
- Medicare and supplemental insurance covered the issue
- ignorance
- I'm not certain that my health issues are Hanford related.
- I have Tri care
- Easier, won't be sued by the state .
- 
- My management did not want to report an accident or incident. It would reflect poorly on them.
- In the process of getting diagnosed with several conditions..
- 
- Hanford Health system is politically lead. A negative Covid test still means you must take weeks off of work with no pay.
- Less hoops to jump through and pressure from bosses not wanting mark on their record.
- Was injured while at work and had to do a 3rd party evaluation, as required by Penser. During the evaluation they decided my injury wasn't work related. Since that time I have been to different doctors all at my cost.
- Because the system is a joke, especially if you are from yakima, I have used both, and when I had to come back from workers comp, nobody knew what they were doing.
- Penser takes too long to approve: medical care, testing, labs etc

- My health issues are extremely rare for someone in my age group. The medical personnel think that it is related to my work at Hanford but it can't be proven.
- Because it was not diagnosed at work. My healthcare provider urged me to open a claim for my condition. I don't want to jeopardize my employment.
- Had private insurance. Didn't know how to get helped pay for caregivers.
- I am getting older
- No clear link between my tumor and the site.
- You would lose your job.
- Because I have it.
- Less hassle
- The workers comp system is not user friendly, timely or fair.
- 
- Paid my own bill prior to compensation program
- Not available where located.
- Reporting incidents at work damages safety statistics and could have negative effect on personal job security.
- diagnosing and treating numerous skin cancers.
- They would not accept the evidence that I had
- My health care provider is a Naturopathic Doctor.
- they refused to cover the prescriptions for my covered condition
- I did not want to have to argue with them that it happened on the job. While they make you fill out paper work and still deny that it happened .
- I haven't got hurt at work to be able to use it
- Easier
- Loss of hearing, skin rashes
- Unaware workers compensation was available
- workers comp system is a joke
- This is what I have access to
- Claim was denied
- Don't live close
- Easier

- Don't know if work related
- It was diagnosed many years after I worked there.
- L & I won't cover it
- Due to the fact that our workers compensation denies any affects are due to work exposers.
- workers' compensation ran out
- RCW 51.04.130 Industrial insurance coverage for Hanford workers—Special agreements. Penser 3rd party insurance company hired legal counsel to deny claims as used RCW 51.04.130 to state did not have to disclose what employee was exposed to. EEOICPA stepped in which President Clinton put in place.
- clam denied
- Wasn't recognized as a current accepted condition by DOL.
- We earned a bonus if we did not have a work related injury
- Because local doctors refuse to deal with worker claims.
- I have never filed a worker's compensation claim.
- To big of hassle to prove that it happened from Hanford
- Haven't had a work related issue.
- Wasn't sure if i qualified
- Retired at time of diagnosis
- unclear if covered due to work status since was not direct employee Hanford
- Using onsite facilities and the hassle they present is not worth it
- Afraid of workplace retaliation
- Was not told that my cancers might be covered by work related health care
- Not sure what causes the cancer and hert problems very hard to breathe
- I didn't want to get laid off or lose my job
- Problems getting care
- Do to DOL money off set
- Too many issues are denied by worker's comp...as not related.
- The Washington State workers comp system is a convaluted mess- excet for the Hanford Presumption law, which has helped. However, even with a claim that is apporived local doctors do not want to take L&I claims because of the state
- Stigma

- Too difficult filing a claim
- Because events were denied by contractor and symptoms took 20 years to show on tests.
- It's easier
- Tried DOL for previous event from more than 25 years ago, it was denied
- Because the hospital codes are different than the government codes. So I have to pay the bill.
- Easier to use
- Wasn't sure it was work related or aging over the years
- Because MSA makes it so difficult to file a claim.
- No doctors take L&I cases and many health issues are not recognized/diagnosed as a direct result to exposures at hanford. Neurological, heavy metal poisoning, heart damage due to heavy metals, lung damage due to radiation exposure.
- Too much hassle with WC
- Fear of the company
- Because that's all I knew was available at the time.
- Because of the red tape and bureaucracy involved in L&I (Penser).
- Worker comp is to hard to us
- Doctors and hospitals is Out of network
- Cancer - Got jerked Around by DOE and Threw My Case in the trash but I'm not done
- Because the doctors preferred insurance vs I and I, and for \$1k out of pocket, it was easier to go through private insurance.
- DOE deemed that my health condition was not their responsibility.
- Process for worker's compensation is slow and many doctors will not treat you under workers compensation
- Worker compensation frowned upon by company
- 
- They usually let you go if pose a threat
- Hanford work claimed as not contributory to the Cancer.
- My access too doctor easier and do not need to be explained,
- Fear of reprisal.

- Lack of trust due to denied claims, the run-around due to red tape, pressure to return to work before physically ready.
- Too much of a hassle trying to access worker's compensation, being questioned about things again and again, etc. I reported a work related issue many years ago while working at Hanford and initially I was treated fine about it (by my manager and the company workers comp folks). When the same type of problem flared up again later (with a different work group and manager) I was almost berated for saying the condition was work related - even though it was already documented from the first occurrence and treatments). And overall the whole process and paperwork for something being work related was a pain.
- My treatment was not covered by workers' comp.
- Easier. Doctor don't want to do the paper work related to workers comp.
- Because if you file a claim and there are issues you cannot get private Ins to help you until you sign off on the L&I claim. Sadly there are thing L&I will pay for that private win't also.
- It was easier because I didn't have to fill out tons of paperwork that was hard to understand.
- My claim was denied
- The workers comp system at Hanford is too difficult to manage
- I am a disabled veteran @ 70% which covers all cost along with Medicare and private insurance
- Forced to due to D.O.L. jerking us around.
- Because they take so long to pay. I pay the provider myself and seek reimbursement. It has taken up to 4 years to receive my compensation. They are awful....
- They would not pay.
- My diagnosis was considered a "common" health problem and therefore not covered by worker's comp
- Easier.
- Better care and response. Panzer is a joke.
- It takes weeks, sometime months to straighten out an L&I claim and sometimes you wind up paying all the bills out of your own pocket.
- I have no insurance anymore I pay for everything out of pocket I can't go to doctor even if I want to. And I'm unemployed now
- Hanford fought me for 7 years to accept my conditions caused by a severe chemical exposure.
-

- Because of privacy
- Workers compensation was not approved prior to treatments.
- Faster results
- When I came back from covid (5-1/2) I was put in a very active, strenuous job. My shoulder became very sore. I thought it was cause I was off so long. So I didn't think it was a issue. But now I have constant pain in my shoulder. But people get written up when they speak up after the event.
- Panzer makes processing claims nearly impossible. Was easier to use ptb time then deal with them.
- Doctors refuse to say the problem could have been a result of working at hanford.
- Concerned of company retaliation/loss of employment.
- Needed faster care
- The uncaring hassles
- For a couple of minor injuries it was just easier to use my health insurance than go through the workman's comp paperwork.
- I have recurring medical evaluations under the Cold War Patriots program, that medically evalustes my health every 3 years. I hope it continues in case I develop illnesses for asbestos, beryllium, or radiation exposures when I worked in the Hanford area and other DOE areas. So far I have not had any complications the require compensation, but what if they develop in the future? A compensation program needs to continue for all current and past employees working in the Hanford site where exposures occurred due to radiation, materials and chemicals there on the sites.
- It was less stressful than proving my injury was related to the walking and working surfaces at WTCC
- Not as difficult to complete
- I was told they could not tie it to work.
- Back problems couldn't wait and fight it out
- DOE and Pender fight every exposure with unlimited funding to do so. I was taken to L&I court over an exposure claim myself and the state provided proof it happened and DOE and PENSER fought it for almost a year and a half so you have to drop out due to not affording a lawyer plus you loose all the vacation time as they purposely plan meetings and appointments on company time so it's vacation time for us hourly folks. I fought it but they cleaned me out financially and vacation time from work due to their unlimited budget to do so. Then MSA our contractor turns away when you need their help promoting the chilling effect widely seen at hanford these days. They hold the money so they have ultimate control on the claims.
- I've never put in for claims



- Because since 1989 I have been trying to locate my work history from Hanford and have been denied benefits as fast as I apply for them.
- Because they said there was nothing wrong with me and I went to my doctor and had stage two tears in my back (MRI)
- Don't trust them
- I had Prostate Cancer. Might have been caused by radiation or chemical exposure at Hanford. I couldn't prove it si I took care of it.
- Was retired when problem became apparent
- I was not and am not aware of any other options
- As not many doctors take the DOL white card
- Due to denial of treatment, even after L&I appeal upheld claim, from DOE/self insurer to approve treatment needed.
- Easier to deal with
- Penser the L&I people draws every thing out or refuses the doctor recommendations like for MRI
- DOE fights every claim. They have attorneys that do nothing but fight hanford claims.
- Not sure if I am dealing with work related issues.
- Didn't have workers comp.
- Ventilation system created a "sick" building. I was repeatedly sick with respiratory issues until I retired.
- Can't prove it was work related
- My claim with the DOL was approved only recently, eight years after I retired.
- did not know about or understand procedures
- Need to treat symptoms asap.
- My claim was originally turned down it was around 1994
- Company WC refused to pay.
- Penzer is ridiculous, to file a claim and get approval is worse then dealing with L&I. So took ptb and had surgery.
- No info on where or how about workmans comp
- DOE highly scrutinizes medical providers' ability to make a work-related exposure causality determination. Getting employers to admit culpability after a Mercury exposure is almost impossible. My symptoms are "age related". Getting a CBD diagnosis is also farsical. My pulmonary issues are due to simple "asthma" or " acid

reflux". Even though I was diagnosed Beryllium sensitive from an exposure years ago. It's ridiculous.

- Easier and more convenient
- Waited you long to report
- Health effects show up later
- Had to
- Injuries sometimes arise at the EOS or symptoms show themselves after shift ends.
- It was used by mistake
- They wont do anything
- Physicians in the area are so poorly trained in chronic exposures at Hanford that they don't want to take the time to evaluate patients to determine if Hanford exposures contributed to the illness. Without a physician backing your claim it is a waste of time.
- Because I didn't want to fight with L&I anymore and be told we're ! Had to go
- easier, less hassle
- I was told (point blank) by contractor L & I liaison, that my claim would automatically be denied by the third party L & I administer.
- big hassle to reopen case
- Disagreements with management over when health issue happened
- employer continues to question claim have been told it is okay to use claim but that i could be held liable if court finds in employers favor
- Because workers comp claims are denied and if it's not reported immediately it's denied. Getting hurt at work and not knowing it's work related gets you in trouble.
- Worker's compensation is slow progress in injuries diagnosis process
- Tired of all the questions interrogating me whether it was work related or not.
- I want to get help instead of going through red tape.
- Penser makes it way to difficult
- Contractors are excluded from decent care
- Easier
- Faster
- Was retired at the time of cancer diagnosis.
- Fell at work, hurt my shoulder right before I retired and didn't report it.

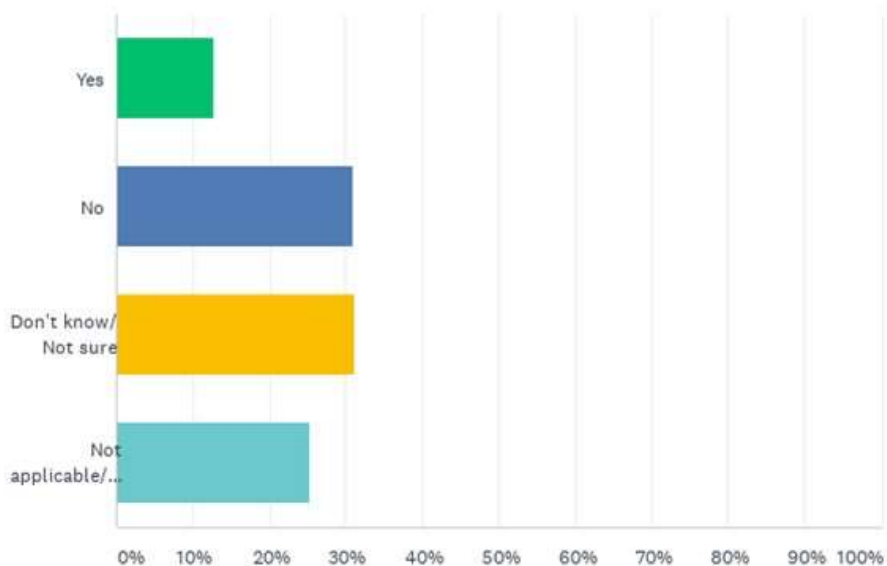
- Easier access.
- Didn't think about doing anything different.
- Didn't want to deal with LI they are a pain in the ass
- Just got approved for L&i after 3 years
- On-site medical staff lack the ability to diagnose chronic health problems such as back, shoulder or hip pain. The medical staff and management spend alot of time trying to absolve themselves of responsibility for poor working conditions.
- Most won't take it.
- To much hassle to deal with, if you open a claim they do their best to cost it quickly  
And you still have to use your insurance
- PTSD from work in a hostile environment, sleep terrors.
- Worried about not letting me do my job
- My diagnosis is not listed as part of the program to help.
- Easier
- Can't say. Specific health diagnosis.
- not sure what is covered by work related
- too much employer harrasement
- Less hassle
- The system is too complicated. It'd take too long to get the workers comp claim started and I need the attention now
- Workers comp was denied
- Because of the third party admin. It's a absolute pain in the ass to use. Their favorite word is No
- My word against theirs
- Fear of retaliation or being laid off due to using the Workers Comp
- Its easier that way for minor things
- Not knowing what caused my symptoms at the time.
- Pain in the but!
- Was injured but wasnt fully aware of how bad at first. Over time injury required surgery but i hadnt reported it initially.
- Paperwork, not worth hassle. Symptoms not present until later...

- The process with workers compensation/Penser NA is slow and difficult. They deny legitimate claims that should be covered.
- 
- Easier
- Takes too long to get approval. In my case skin cancer.
- Easier
- It's easy and great coverage.
- I was denied my EEO/PCA claim
- Because doctors in our community refuse to deal with L&I because of the ridiculous amount of paperwork. Therefore, they won't take you as a patient or perform surgery if you are using L&I.
- Immediate care was needed...could not wait for a claim to provide payment to medical provider at the time of need.
- Local Medical Professionals lack the knowledge to link exposure to illness.
- Sitting at a computer all day has caused my health problems that my job doesn't acknowledge.
- Have not been accepted into the Hanford workers medical program
- Can't get a claim thru
- When you go they look at you quick and say oh your ok and can go back to work. That's all they care about.
- I didn't want to fight with wc
- System is too slow. Penser is/has been denying claims or parts of claims when they are not qualified medical professionals to do so.
- Doc did not take workers comp.
- I am a veteran and it is easier and less of a hassle as they don't need justification of my condition. they just treat me
- Said too much time had past since injury. So I and I declined it.
- Inadequate and long process for care. Fearful of upper management.
- At first the doctors didn't believe it was work related.
- Because they would rather claim age as the problem than the incident
- Because it pays me closer to my full wages.
- The hassle of proving I got hurt at work.

- It is such a hassle dealing with the company (employer) and the contractor the manages workers compensation. I would lose a limb and not want go through that crap again! I have hurt myself at work n not reported it because you are treated so badly!
- easier
- Easier to get treatment

**Q22: I am satisfied with the workers' compensation process (including claims administration, claim authorization, and independent medical examination).**

Answered: 1,174 Skipped: 487



**Q22: I am satisfied with the workers' compensation process (including claims administration, claim authorization, and independent medical examination).**

Answered: 1,174 Skipped: 487

ANSWER CHOICES	RESPONSES	
Yes	12.78%	150
No	30.92%	363
Don't know/ Not sure	31.09%	365
Not applicable/ Does not apply	25.21%	296
<b>TOTAL</b>		<b>1,174</b>

Freeform Responses:

- Its stacked against the worker
- I have three conditions from Hanford
- Claims Manager for L&I who handles all of WTCC Claims does not report the proper wages or medical benefits when he has a claim from a worker who is working for WTCC. This causes many workers to lose out on Time Loss Monies they are owed
- Don't trust them, seems to be more for the company
- worked at hanford years ago. had cancer years after exposure.
- They terminate you before you can use
- Claim denied. I could not produce enough documentation from 1976
- Again, biased and not specifically trained in the process of EEOICPA
- They act like it's their money you are using.
- Because too many workers are denied and appeal process is a very short timeframe
- Takes too long and sometimes confusing
- Doctors that I went to on the Hanford project made a sexual Advance towards me
- Way to cumbersome and frustrating
- Didn't hav a test
- They didn't want to know what the problem was, just when you can get back to work
- DOE has hidden the truth in medical records and exposure to it's workers.
- It's like walking in a minefield.
- See above
- time the process takes and possible denial after waiting 4ever
- Hanford tryed to make my incident my fault and took NO responsibility.
- You can wait months to get an appointment with a doctor that takes Penser, after you wait months to find out if you are going to be covered
- It took 16 months to receive my white card and compensation for my CBD.
- Bladder cancer associated with Hanford workers is likely bit my claim was denied.
- They are more worried about there safety rating and numbers then taking care of the problem
- Tested positive beryllium sensitivity, but have not had follow up exam for several years. Not sure where to go.
- Never had an issue.

- still in process. two years since i filed
- Claim denied twice for skin cancers
- They use delaying actions. I have been working the process for 27 months. They keep asking for doctor signatures. Doctors are tired of playing the games too.
- Takes too long, hard to get all documentation required, they don't offer any assistance
- So many hoops to jump through to get necessary equipment that's used daily. Separating which one of my conditions is covered or not.
- Heard of many delays and claims rejected.
- Hard to get claims approved
- Originally denied and they didn't inform about exposure for over a year
- THEIR SYSTEM ONLY TRIES TO GET RID OF YOU
- Your kidding right?
- Not sure if the referral made by workers comp. was unbiased.
- They sent me to a doctor of their choice and he totally had a preconceived idea of my situation and would not even listen to me. He was a total prima donna.
- The L&I claims at Hanford – people try to do her best to make sure workers with ligament claims get support for their claims. Sadly DOE is over this contract and not a independent qualified organization who has the authority to champion these hurt/sick workers needs stronger over sight by independent non government organization
- Can't afford the loss in wages and long wait for compensation
- There should be an independent separate agency for exposures and chronic care.
- Unresponsive to my questions and understanding personal work history.
- They lie harass your private doctor with so much paperwork and fight you all the way if IME sides with you they do not finalize the report
- They do not act as an advocate for the injured worker.
- Don't have any idea how to use or if it applies to me
- I haven't heard of such services.
- Army veterans are being denied the health care offered to other retired employees.
- I went through 2 separate IME exams. Both sided with me but the company still did not allow the benefits. Instead, after 3 approvals by Washington State, they appealed the decision at every turn even after 5 specialists, 2 IME's, an Environmental and Occupational Health and retaining legal representation.
- Doe has bad record keeping, working at n reactor doing ball channel repair in hindsight was insanity. Looking into the core of the reactor



- administrators in the past have been more focused on saving money and not on ensuring patient's health and return to work
- Too sloq
- DENIED BY HR @ PNNL
- Because they will delay care if you claim but if you just make it a medical claim it is better/faster
- I did not informed I could receive compensation before my case was closed. I was told by a coworker after the fact
- Hassles, make you feel like being judged. Would not let me come back to work as an operator but yet said I could come back as an HPT
- Penser was difficult to deal with. My claims processor was always hard to communicate with. Multiple times I would call and not hear back for days and on occasion greater then a week.
- When returning to work it seems it is not the same for everyone.. and get contradicting answers for questions that are asked or how to return to work
- Have to fight to get care or prescription
- No experience with that process
- Retired
- I don't know the current conditions.
- Time frame for getting compensation, the amount of time and effort to enroll in compensation.
- See above, treated disgracefully by three levels of L&I management (Washington state)
- Does not cover all testing procedures or treatment therapies.
- It's a constant fight to get them approve and cover claims.
- I don't feel like my illness is taken seriously
- Claims that were paid to folks i work around me didn't make sense
- Claim was handled with bias
- Hard to get claims approved and navigate system
- Workers comp does not work very well. Too much red tape.
- Can't get the help you need
- Our worker compensation denies claims or responsibility. they work for the employers.
- the claims people are biased to the system not the patient

- Poor ability to share information/records between or among various parties involved in assessing exposure and potential health effects
- There not given all information what employees are exposed to and employees do not know all the hazards to best represent themselves as well as physicians do not ask the questions pertinent to hazards of a job. EEOICPA would not have come into place if there was adequate coverage for nuclear employees. University of Washington did studies on workers too but lack of information of what employees work with is not able to help them. As well as legal counsel are not given full disclosure of exposures - again RCW 51.04.130 comes into place. Under freedom of information act if you request records they are blacked out as well as there are margin of error on data collected. Example- receive a 1 everyday on dosimeter, margin of error allows a 2 range. So a 1 is canceled out even though everyday you receive a 1 your dose for a month is '0'. Unless you understand the reporting process this is an item overlooked as well as MSDS are for 1 chemical which employees use multiple chemicals such as the tankfarms/labs.
- I believe it is inadequate and unequal
- Because most retired or even current employees feel that most local doctors depend on Hanford. Being that's Hanford is their main source of income.
- Little or no oversight of workers comp
- claim denied
- THE DOL MAKES IT TOO HARD TO QUALIFY FOR HELP.
- we had officers let go because they could not r we turn to full duty
- Retired
- DOE controlled and employer overseen.
- It's criminal the way it treats injured empl
- I provided hundreds of pages of my medical records. The workmans' comp folks ignore everything, they simply don't have the workers (their excuse).
- Not worth it putting job on the line
- Over complicated, you get the runaround
- Not enough long term care/follow up.
- Will not make a determination without a biopsy
- Penser is the administrator for the DOE for worker's comp claims. They are a joke. They have been caught on more than one occasion messing with claims and claimants. , even by internal DOE reports, yet they are retained. Even withthe presumption law DOE and Penser continue to violate the rules and make the claims as difficult as possible.rts

- My husband's illness was handled well in Richland, but calls from higher up were very stressful.
- I've been over a year and a half without medical treatment for a work injury due to Penser/L and I prolonging the process.
- Frustrating & long term documentation process. Also it was hard to find contacts for as st DOL & Fed DOL.
- The contractors do not make it easy for the employee
- Penser is still not being held accountable for injured workers at hanford.
- Lots of cheaters inWC
- Never used
- PENSOR is the worse. They are very negative to the customer- ie the workers
- states system is biased
- Twist EVERYTHING !!! Be Honest I Was The Contaminated One !!!
- See above #21
- They are trained to deny you, not to provide you with care
- They are company focused
- No Doctors want to take L & I claims
- See previous comments. Independent medical examiners can be biased towards company. Claim authorization denied or delayed.
- Too many hoops you have to jump thru for a claim to get ok'd.
- I started having issues when I was working on N reactor in 83 or 84. I started urinating blood while working on the shut down. Even though in ended up with bladder later everyone said they didn't know.
- I think I had to go for two or more "independent" evaluations and was questioned about the same things again and again even though it seemed pretty obvious that the issues were due to my work activities. It was a real pain, having to take a lot of time off from work, although it was paid time, special time card coding, the manager not sympathetic to my issues, etc.
- Because even after having two internal depositions and having problems and a couple surgeries with us I was told they can't prove that it was cards from the internal depositions so they pretty much ignored me
- Did not cover my treatment.
- Ever time you turn in a claim it gets turned downed. You have to appeal everything.

- I am in one now for 2+ years. They have every right to shut down settling my case until my time runs out. So they do unless I hire an attorney.
- I was unhappy with how I was treated. My claim was over 20 years ago. I had two claims for exposure to Vapors and they decided to combine them to one claim which I didn't think that was right. My respiratory system was compromised and also my feet went numb and I couldn't walk for a time. My feet are still numb to this day. I have peripheral neuropathy in my feet. My claim was denied and I'm bitter about it. My blood oxygen is low and it shouldn't be that way.
- I did not obtain any useful help from claims administration, which is geared towards non-manual employees.
- Dd.O.L. seems to change the "rules" whenever they see fit.
- Claims take forever, they do not have a comprehensive list of requirements...but continually send correspondence requesting additional information. It is maddening. This process is horrific.
- Because I was accepted but they don't always pay even though DOL has sent letters saying I don't need to pay. After several calls I just paid the bill.
- Much harder process than just using my own insurance. CHPRC strongly discouraged use of Workers Comp. Offered little help to educate on the process and filling out paperwork in order to use mistakes to prevent use of Workers Comp. also implied threat of retaliation for raising associated issues with their discouragement.
- Useless
- The process makes you feel like you've done something wrong and have to prove you deserve their help.
- I know nothing about this process
- They did not protect my right to keep my job while on a work accommodation plan.
- The DOL is constantly changing the rules to make the process far more cumbersome than it needs to be. They try and act like an insurance company but have very draconian rules that are inconsistent with industry practice.
- too slow
- Process is complicated.
- Takes too long, and poor care.
- Panzer makes processing claims nearly impossible. They are supposed to follow the same process as L&I, I have dealt with them and are much easier to deal with.
- Too much red tape! & rejection
- Currently the Hanford Site through Pensar fights and tries to deny any and all claims
- Takes too long checking off boxes on a form instead of care

- Same as above
- In one case, the case was closed by the contract doctor when I felt it should not have been.
- The doctors here said lung plursesey
- You're guilty of working unsafe
- It's an uphill battle to get any help from them
- My claim was rejected
- I'll let you know
- Calls are never returned and the help I was promised never happened since 1989 to date.
- Even though I was diagnosed with serious illness and treated the primary concern seems to be to protect the government not take care of my problems
- Haven' t looked into it.
- When I had claim they put onus on me.
- Dealing with the state is just plain terrible
- 
- contractors onsite turn over full control of claim to DOE/self insurer for administration and approval. Contractors do not have contract with self insurer but depend on DOE and their umbrella and the employees of the contractors are at the mercy of DOE/self insurer
- It's for the employees it's about saving money
- They fight every claim. They leave people hanging out there for years sometimes with no closure or resolution or surgery if needed.
- DOE controlling the process for claim acceptance
- There is no trust with Pensar North America at all.
- The IMEs are not for the workers best interest.
- Company is in denial about building issues.
- Too cumbersome to apply. The process takes too long. It is next to impossible to get the medical records from the Hanford contractors.
- Post exposure should be compensated from day 1 and not be subject to first 3 days of missed work while being evaualation or recovering from an (vapor) exposure.
- It is not fairly administered and it fails to approve claims from actual affected workers
- Could be faster

- Case management sucks. Doesn't help employee
- Took 5 years to get approved. Company delayed approving so wouldn't have to. Figured I would give up and they wouldn't have to pay.s
- You are treated different
- Penzer is HORRIBLE to deal with. Trying to get on the job injuries taken care of should not be so hard.
- However with my experiences needing workers compensation was with obvious issues (broken bones).
- Penser is not looking out for workers
- Doctors encouraged to close cases
- Waiting for me to die
- Claims are denied and undue stress is placed on the injured workers
- Whether at Hanford or elsewhere in the State the Workers Comp program is overly beauracratc and focused towards CYA and assumes the worker is trying to scam the system.
- To slow and medical check is with old retired doctors that didn't seems to be all there.
- Unless it is an injury or illness a supervisor witnessed they don't believe the worker
- Read the above answer that is all I have to say
- too many hoops, always feel that I was being judged
- See above.
- Always deny claim. Always have to retain attorney to deal with workers comp
- ime are useless they dont even examine you for the issue at hand
- Because you have to fight for benefits every step of the way even when it's diagnosed as work related.
- It should be handled by L&I and not a private company
- I had a lower back injury that required surgery. Have been pain free since surgery. Workers comp would not allow me to get the service I needed to live a healthy happy lifestyle
- na
- Currently retired
- Prostate cancer not included in comp

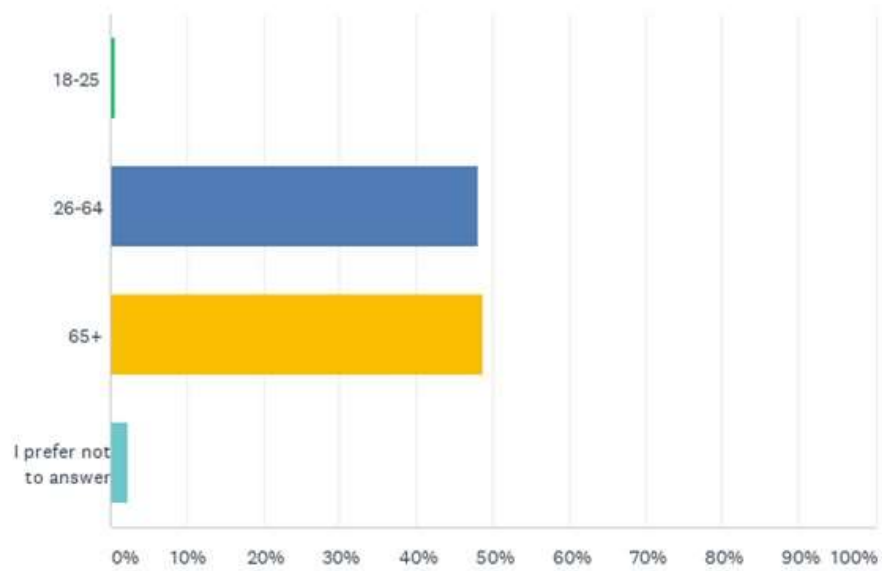
- They say you have to work 50% of your career in order to qualify. It only takes 1 exposure to have health issues. I received a couple of severe exposures but was denied help.
- Too much tape
- Workers' comp wasn't part of the process back in the late 80s's
- Too much bullshit
- Process makes it difficult to obtain and keep treatment
- My diagnosis came years after my 30-year career and I filed DOL claims, but was denied.
- Never used workers comp.
- Too complicated
- Too much automated answering and run around.
- Again third party admin. Makes it impossible to have any success
- Process not explained very well. Hard to get a hold of claim person to ask questions. Checks didn't always arrive on time. Difficult to submit weekly claims.
- Penser is very frustrating, bad communication, denying previously approved coverage.
- Because they fight you the whole way
- Ever since the third party administrator took over disapprove more claims and fight the people along the way. The DOE is Totally mismanaged anymore with the latest manager I have never seen it in the history of the Hanford site as it is today there needs to be a major change in DOE management
- Had a bad experience with an individual examiner.
- Paper
- The process with workers compensation/Penser NA is slow and difficult. They deny legitimate claims that should be covered.
- The current workers comp is a joke. Everyone has a story about getting screwed over!
- Explained to me that EEOICPA purpose is to disprove claims and to work towards denying claims rather than helping former employees with their medical aid.
- Penser, third party system needs to go
- Process to slow
- A large part of my health problems are from the sedentary work environment.
- See above
- Third party administration making go to IME until they get the answer they want

- Explained above.
- The independent medical exam Dr.s make you feel like you are lying about what is going on with you. They disagree with what your personal Dr. says
- Slow process and Inadequate coverage
- Not enough medical staff is familiar with the EEOICPA program.
- It is not an easy process.
- It has to many hoops to jump through. And knowing that I will be less compensated is a stressor.
- Penzer was a extremely difficult to work with
- Administration of process is inefficient. Staff I dealt were very slow to process things.
- Hard to get treatment. Dr. Is working to deny claim or quickly close it out



**Q23: My age is**

Answered: 1,171 Skipped: 490



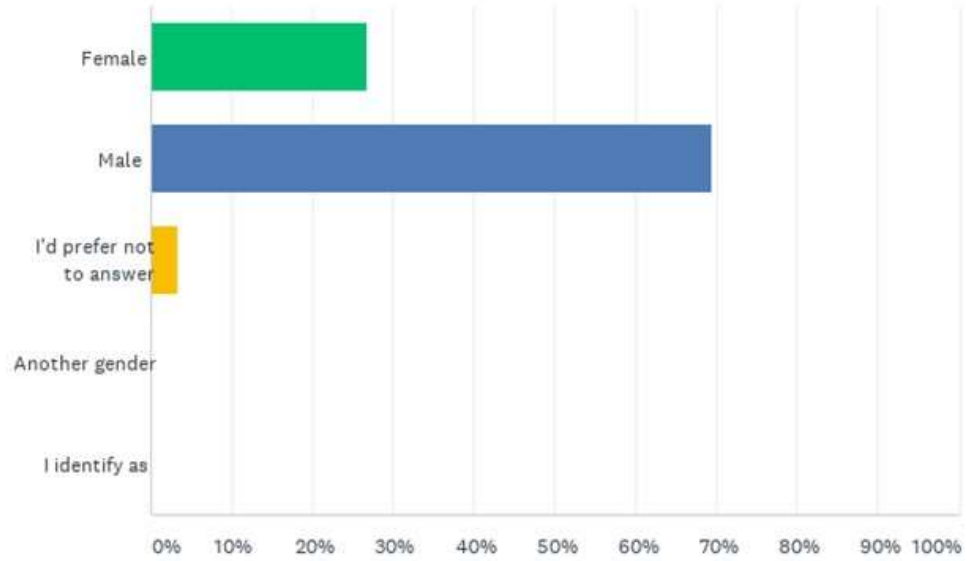
**Q23: My age is**

Answered: 1,171 Skipped: 490

ANSWER CHOICES	RESPONSES
18-25	0.68% 8
26-64	48.16% 564
65+	48.85% 572
I prefer not to answer	2.31% 27
<b>TOTAL</b>	<b>1,171</b>

### Q24: My gender is

Answered: 1,169 Skipped: 492



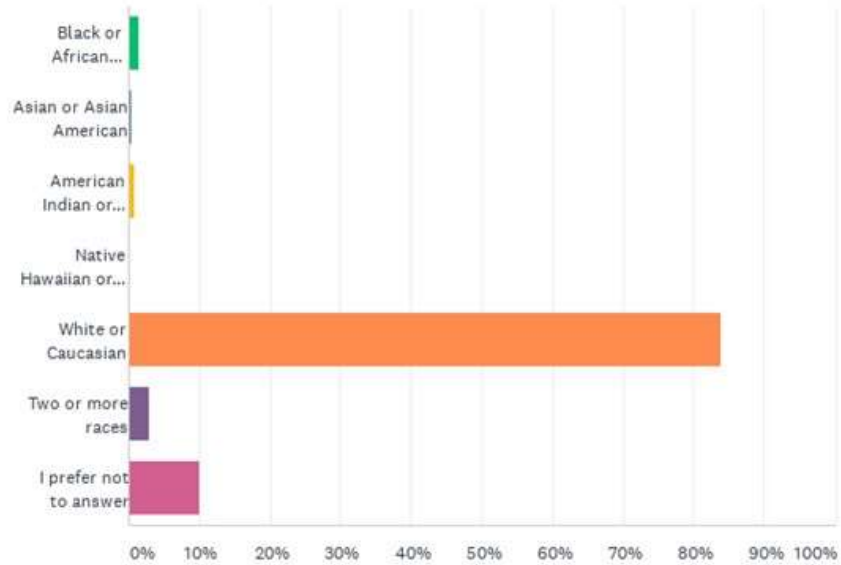
### Q24: My gender is

Answered: 1,169 Skipped: 492

ANSWER CHOICES	RESPONSES	
Female	26.78%	313
Male	69.55%	813
I'd prefer not to answer	3.42%	40
Another gender	0.00%	0
I identify as	0.26%	3
<b>TOTAL</b>		<b>1,169</b>

**Q25: My race is**

Answered: 1,161 Skipped: 500



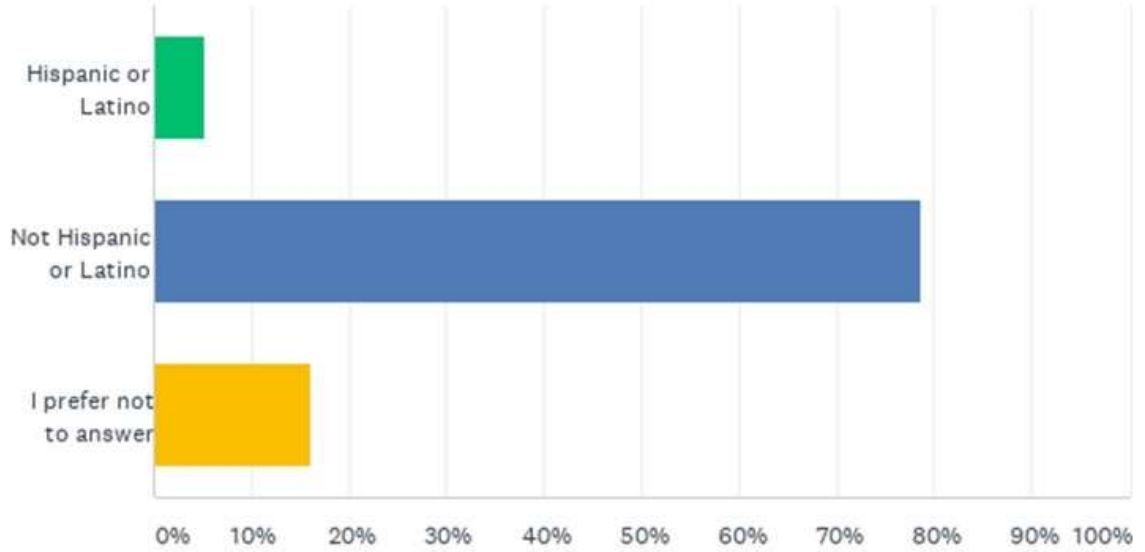
**Q25: My race is**

Answered: 1,161 Skipped: 500

ANSWER CHOICES	RESPONSES	
Black or African American	1.55%	18
Asian or Asian American	0.43%	5
American Indian or Alaska Native	0.86%	10
Native Hawaiian or other Pacific Islander	0.26%	3
White or Caucasian	83.81%	973
Two or more races	3.01%	35
I prefer not to answer	10.08%	117
<b>TOTAL</b>		<b>1,161</b>

**Q26: My ethnicity is**

Answered: 1,099 Skipped: 562



**Q26: My ethnicity is**

Answered: 1,099 Skipped: 562

ANSWER CHOICES	RESPONSES	
Hispanic or Latino	5.28%	58
Not Hispanic or Latino	78.71%	865
I prefer not to answer	16.01%	176
<b>TOTAL</b>		<b>1,099</b>